



Monterey Bay National Marine Sanctuary VISITOR CENTER Santa Cruz, California

PRE-DESIGN REPORT / DETAILED PROGRAM REQUIREMENTS
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1.0 Executive Summary

1.0 Executive Summary

The National Marine Sanctuary Program and the City of Santa Cruz are partnering to design and construct the Monterey Bay National Marine Sanctuary Visitor Center. The Visitor Center will provide approximately 350,000 people per year a unique hands-on introduction to the diverse ecosystems of California's Central Coast and will encourage stewardship of the sea and shoreline.

The project will be located in the Beach Street/South of Laurel neighborhood of Santa Cruz directly adjacent to the beautiful Monterey Bay. The City-owned 3/4 acre property is currently known as the "Fun Spot" and is within steps of Santa Cruz's world famous Beach Boardwalk, surfing at Steamers Lane and exceptional views from Lighthouse Point.

This document will outline the proposed building and site development to support the educational and informational program of the Monterey Bay National Marine Sanctuary (MBNMS). The proposed public plaza and 16,170 gsf visitor center were developed to fulfill project goals as defined by the Steering Committee established to lead the process. The Steering Committee includes members from the MBNMS, the City of Santa Cruz, Booz Allen & Hamilton Management Consultants, Thomas Hacker Architects, Walker Macy Landscape Architects and BIOS Interpretive Designers.

In a series of committee meetings, workshops and public meetings, the program and site development were evaluated on how to meet the needs of the MBNMS. Function, cost, context and the integration of interpretive exhibitry and architecture are reflected in the proposed design shown in this document.



1.2 Project Participants

Monterey Bay National Marine Sanctuary

Bill Douros*
Dawn Hayes*
Stacia Fletcher*
Rachel Saunders

National Marine Sanctuary Program

Chris Ostrom
Francis Gilbert*
Ted Lillestolen
Matt Stout

National Marine Sanctuary Foundation

Lori Arguelles

National Oceanic and Atmospheric Administration

Luke Nachbar

City of Santa Cruz Redevelopment Agency

Ceil Cirillo*
Darrell Doan

City of Santa Cruz

Michelle King
Barry Hooper (advisor from Right Lights)

Booz Allen Hamilton

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Mehran Khazra

O'Mahony & Myer Electrical Engineers

Pieter Colenbrander

Bowman & Williams Civil Engineers

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Davis Langdon Cost Consultants

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(*) Asterick indicates member of Steering Committee



2.0 Project Overview

2.1 Design Goals

The Monterey Bay National Marine Sanctuary and the City of Santa Cruz are teaming together to develop a new Visitor Center in the Beach/South of Laurel neighborhood of Santa Cruz on the site of the existing Fun Spot skateboard park. The Visitor Center will provide the public an opportunity to discover and learn about the Monterey Bay National Marine Sanctuary through interpretive displays and educational programs.

The following project goals have been developed and agreed upon by the Steering Committee to guide the decision making process for the Visitor Center.

1. Create a MBNMS Visitor Center and Education Facility which inspires the public to understand and protect the coastal ecosystem of central California.
2. Become a dynamic destination of discovery through integration of exhibits, architecture and site and the creation of educational and exciting experiences.
3. Establish the City of Santa Cruz as a Gateway to the MBNMS through the design and development of a marine education center that enhances the region's existing cultural and educational facilities and creates a memorable experience for visitors to California's Central Coast.
4. Develop a sustainable LEED certified building through the integration of responsible strategies and higher performance criteria that will provide maximum environmental, economic and community benefits.



2.2 Sustainability Goals

One of the primary goals identified for the Visitor Center by the MBNMS and the City of Santa Cruz is for the project to be a model for sustainable, environmentally-sensitive design, construction and operation. Using the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) criteria, the building and site design will implement multiple strategies to achieve this goal.

During the Pre-Design Phase, a preliminary Eco-Workshop was conducted with representatives from the MBNMS, the City of Santa Cruz and the design team of architects and engineers to discuss potential opportunities for sustainable strategies. Below is a summary of the strategies discussed as defined by the six major categories of the LEED program.

Sustainable Sites:

- Use bioswales, storm water planters and other methods of detention/ retention to treat storm water on site.
- Incorporate storm water management as a visible educational tool with interpretive signage
- Use grey water/ reclaimed water for irrigation
- Install light colored concrete or grass-crete paving
- Recycle asphalt on site – use recycled asphalt as a base for other paving surfaces
- Install pervious pavement where possible
- Incorporate a shuttle bus to the employee/visitor parking areas
- Incorporate bike racks/ storage at entrance for visitors and staff
- Install an electric charging station for electric bicycles
- Provide connections to existing bike trails leading to the Depot Park, Monterey Bay Scenic Trail, and Neary Lagoon

- Consider a trolley stop at the site
- Share parking with other nearby facilities
- Provide dedicated carpool spaces
- Provide low level lighting to reduce glare and reduce light pollution
- Incorporate an eco-roof or cool roof
- Provide shade for pervious surfaces
- Tap into existing infrastructure (urban infill)
- Restore degraded portions of the site
- Use native plant materials

Water Efficiency:

- Use drought tolerant, native planting
- Install waterless urinals
- Use reclaimed or graywater for irrigation, toilet flushing and other non potable water uses
- Tap into the municipally supplied tertiary treated water from sewage treatment plant
- Use the site as a pilot project for recycled/reclaimed water
- Install high efficiency plumbing fixtures such as pressure assist ultra low flow toilets, automatic sensors in lavatories, low flow or aerated bathroom fixtures
- Install cisterns to collect rainwater – store and reuse stormwater for irrigation or toilet flushing
- Compost food wastes from the kitchen area
- Explore use of a living machine – wastewater treatment as an interpretive exhibit
- Install temporary or high efficiency irrigation systems
- Explore strategies to share approaches with the Coast Hotel for wastewater and stormwater systems
- Incorporate on-site demonstration examples of water recycling for educational purposes

Energy and Atmosphere:

- Radiant Floor Systems (Heat/Cool)
- Chilled Water Systems and Variable Air Volume (VAV) Air Handling Units (AHU)
- Underfloor Air Distribution System
- Variable Refrigerant Volume System
- Water Source Heat Pumps
- "Cool Roof" (Return chilled water sprayed on roof)
- Use set-back thermostats to turn down HVAC after hours
- Recycled gas from Waste Water Treatment Plant?
- Do not use any HCFCs
- Use ocean as a semi-passive thermal sink for cooling
- Insulate efficient systems
- Insulated concrete form-structure = thermal, waste reduction
- Reduce lighting to .6 - .8 w/sf
- Utilize occupancy sensors for appropriate equipment beyond lighting
- Utilize lighting/dimming control systems
- Utilize high efficiency lamps/ballast combinations, occupancy sensors and time clock controls
- Utilize exterior sunshade devices, overhangs and baffles to control solar heat gain and glare
- Integrate solar harvesting strategies via light shelves, skylights, solar tubes, etc., for appropriate illumination
- Capitalize on natural sun angles through building orientation
- Utilize natural ventilation strategies through the use of operable windows or vents
- Demand control ventilation
- Plant trees
- Provide life-cycle cost of MEP systems
- Provide full building system commissioning
- Harvest daylight energy through the use of photovoltaic technologies

- Provide Photovoltaic Education kiosk
- Harvest wind power on or off-site
- Harvest wave energy
- Purchase contract for Green Power from local utility

Materials and Resources:

- Use of recycled (post consumer) products
- Insulation and duct lining from recycled materials
- Recycled content carpet
- Cotton batt insulation
- Recycled glass products
- Rapid renewable material (i.e.: bamboo panels)
- Reclaimed/Salvaged wood products
- Wheat board sub-frames for cabinetry
- Silicate exterior paint (where painted)
- Rammed/Stabilized earth structures (use of marine-origin geologic formation on-shore)
- Use floors in passive solar heating/cooling (Integrate with solar hot water pre-heat)
- Use of building materials salvaged for exhibit fabrication
- Minimize construction waste
- Recycle Asphaltic Concrete/concrete for use as base for new paving
- Set goal of 90% of construction waste to be recycled
- Set high goals for reuse/recycled content above LEED point minimum
- Utilize relocated structure
- Polish concrete floor
- Limit interior materials/finishes
- All finish materials to be California 01350 compliant
- Utilize FSC certified wood products
- Utilize local wood suppliers such as Big Creek and Hayward

- Use recycled aggregate for non-structural concrete
- Utilize structural steel with 95% recycled content
- Utilize fly ash in lieu of cement in concrete
- Integrate recycling collection centers throughout project
- Utilize Native Revival – Capitola/Aptos Native Plant Nursery
- Source local materials for wood, concrete, fly ash and compost
- Utilize Fireclay or other durable local recycled glass tile

Indoor Air Quality:

- Provide daylight and views for 100% of occupied spaces
- Provide daylighting without direct sunlight
- Utilize SMACNA Indoor Air Quality plan during construction
- Purge the building prior to occupancy
- Utilize Building Management Software
- Comply with ASHRAE 55 and 62
- Provide under floor air distribution
- Utilize demand control ventilation
- Provide multi-zone mechanical systems
- Provide natural ventilation through the use of operable windows and vents
- Provide CO2 monitoring for exhibit space linked to ventilation control
- Provide proper lighting design integrated with daylight opportunities
- EMS data, incorporate in displays
- Use carpet which is of recycled content and recyclable
- Utilize non-emitting materials and no PVC
- Utilize low VOC paint and carpet adhesives
- Minimize finish materials
- Utilize carpet tile strategies
- Utilize bi-level 50% light switching (already Title 24 required)

Innovation and Design Process:

- Building as a sustainable education vehicle “demonstration”
- Linking: Sustainability + Education + Explicit Public Awareness
- Provide educational signage for LEED/Sustainable building elements
- Establish a walking tour of sustainable building elements (self-guided)
- Provide a combination of cool roof/photovoltaic technologies for innovation credit
- Put photovoltaic on other Depot site buildings
- Provide storm water treatment Infrastructure at Depot Park or treat some on-site at MBNMS
- Utilize 95% construction waste management
- Integrate a Depot Site excursion train stop at the MBNMS
- Limit local materials to 150 mile radius
- Utilize a LEED certified professional on project



3.0 Program

3.1 Program Description

The following program described in this document was developed through discussions with the Monterey Bay National Marine Sanctuary, the City of Santa Cruz, BIOS Interpretive Designers and Thomas Hacker Architects. The program reflects the MBNMS's desire to educate visitors about exploring the marine environment, the issues impacting the sanctuary and their personal role in protecting an ecologically significant and beautiful ocean environment.

The program has five primary elements: exhibits, classroom, administrative staff offices, giftshop and building support.

The following Program Summary Diagrams indicate the individual program elements in relative scale to each other and are organized by primary use. Each group is identified with a color used in subsequent adjacency diagrams and program plan diagrams.

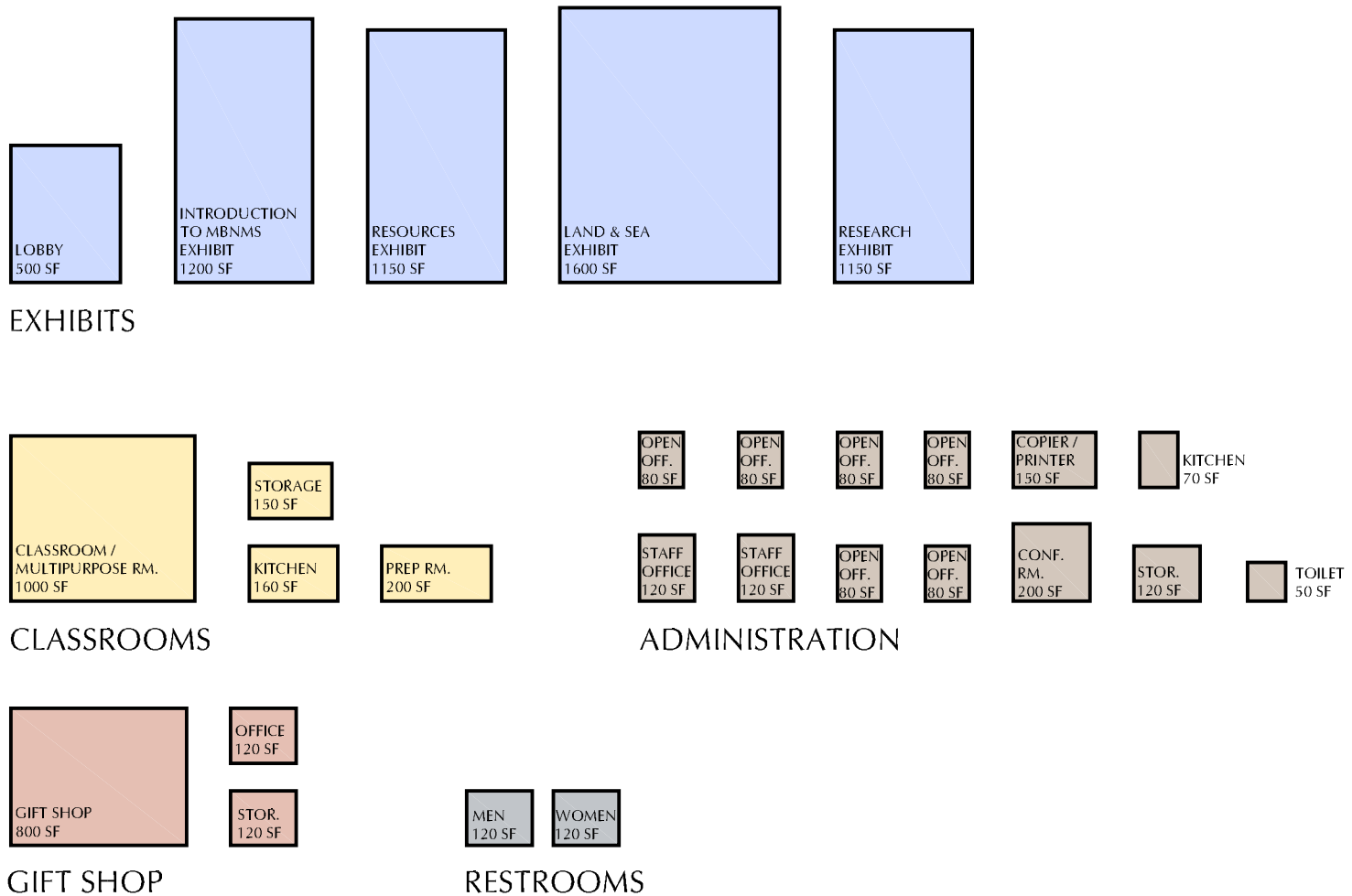
The Adjacency Diagrams reflect discussions with the MBNMS staff and the interpretive designers on how the programmatic elements should relate to each other.

The Program Plan Diagrams indicate a proposed organization of the program elements as they respond to the site configuration, contextual issues and accommodate the required program adjacencies.

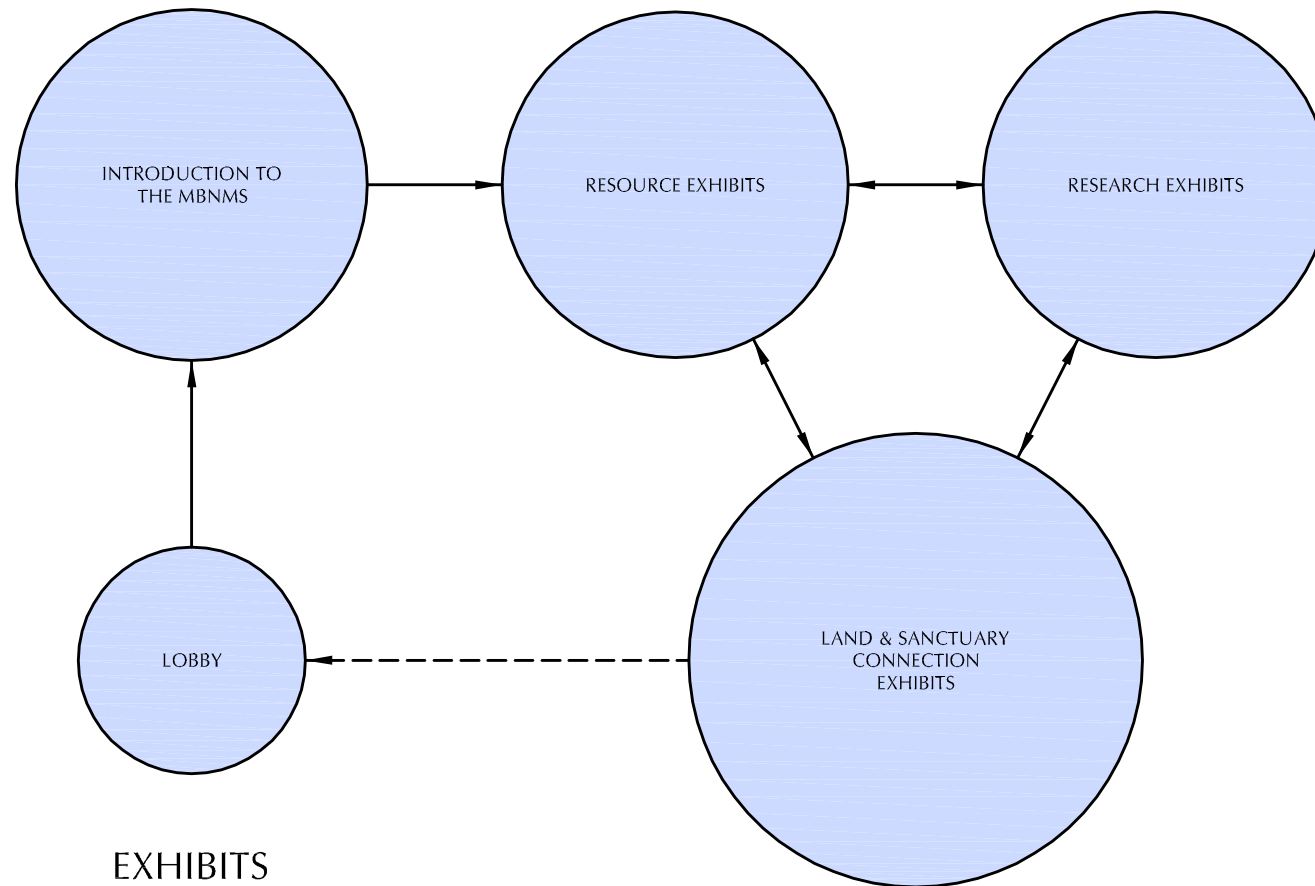
3.2 Program Summary

Space	Program			Actual			Comments
	Area (NSF)	Quantity	Total	Area (NSF)	Quantity	Total	
Exhibits							
Lobby	500	1	500	620	1	620	Include public lockers, stroller/wheelchair storage
Introduction to MBNMS	1,200	1	1,200	1,200	1	1,200	
Resource Exhibits	1,150	1	1,150	1,176	1	1,176	
Land & Sea Connection Exhibits	2,000	1	2,000	1,839	1	1,839	
Research Exhibits	1,150	1	1,150	1,176	1	1,176	
Exhibit Maintenance	150	0	0	440	1	440	
		Subtotal:	6,000		Subtotal:	6,451	
Classrooms							
Classroom/Multi-purpose Room	1,000	1	1,000	1,007	1	1,007	Wet lab for K-12 students. Not less than 900 sf Include AV racks, Storage (open/closed) Storage for tables/chairs/AV carts
Prep Room/Storage	200	1	200	195	1	195	
Storage	150	1	150	143	1	143	
Catering Kitchen	160	1	160	143	1	143	
		Subtotal:	1,510		Subtotal:	1,488	
Gift shop							
Bookstore / Gift Shop	800	1	800	630	1	630	Range from 600 sf to 800 sf
Storage for Bookstore / Gift Shop	120	1	120	0	1	0	
Bookstore Office	120	1	120	124	1	124	
		Subtotal:	1,040		Subtotal:	754	
Administration							
Reception/Open Office	80	6	480	75	6	450	
Education Staff Offices	120	2	240	120	2	240	
Conference Rm.	200	1	200	170	1	170	
Kitchenette	70	1	70	0	1	0	
Copier/Printer Room	150	1	150	148	1	148	
Staff Restroom	50	1	50	0	1	0	
Storage	120	1	120	109	1	109	
		Subtotal:	1,310		Subtotal:	1,117	
Restrooms							
M/W Restrooms	120	2	240	215	2	430	Potential need to upsize when plumbing fixture count completed.
Total NSF:			10,100			10,240	
Net to Gross Area			5,203			5,930	Net to gross in 1/11/04 was optimistic. Net to gross has been revised to reflect concept sketches
Total GSF:			15,303			16,170	
Efficiency			0.66			0.63	

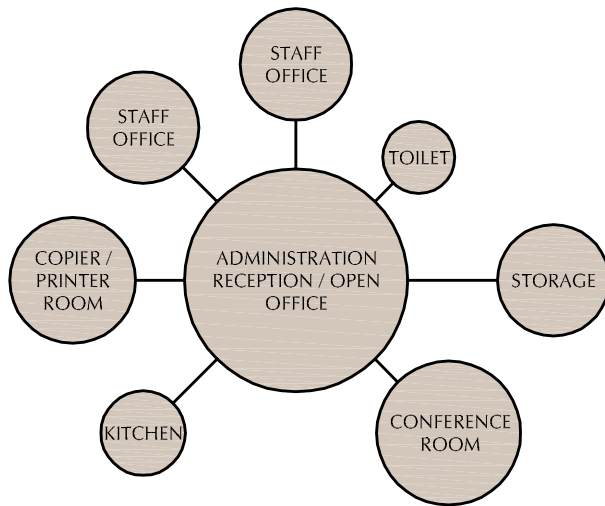
3.3 Program Summary Diagrams



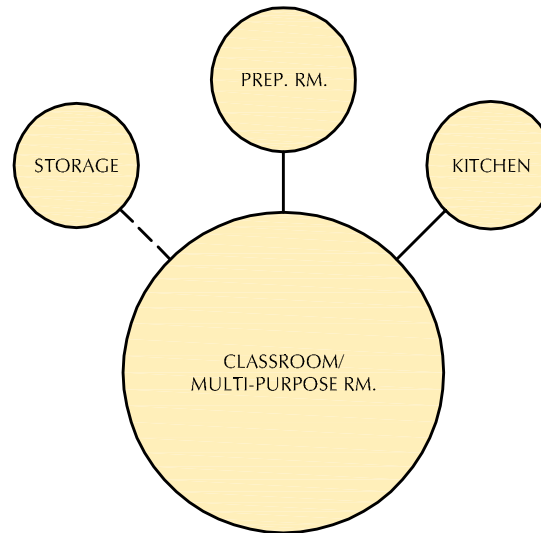
3.4 Adjacency Diagrams



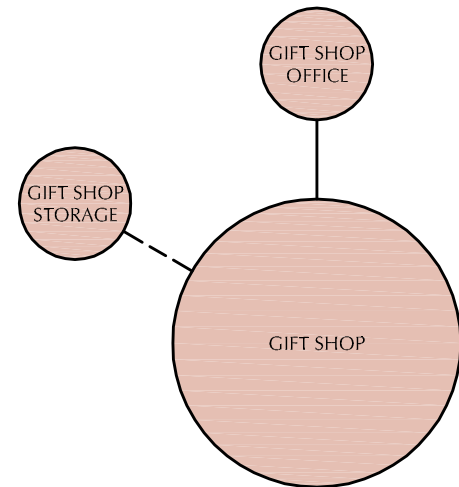
3.4 Adjacency Diagrams (cont.)



ADMINISTRATION

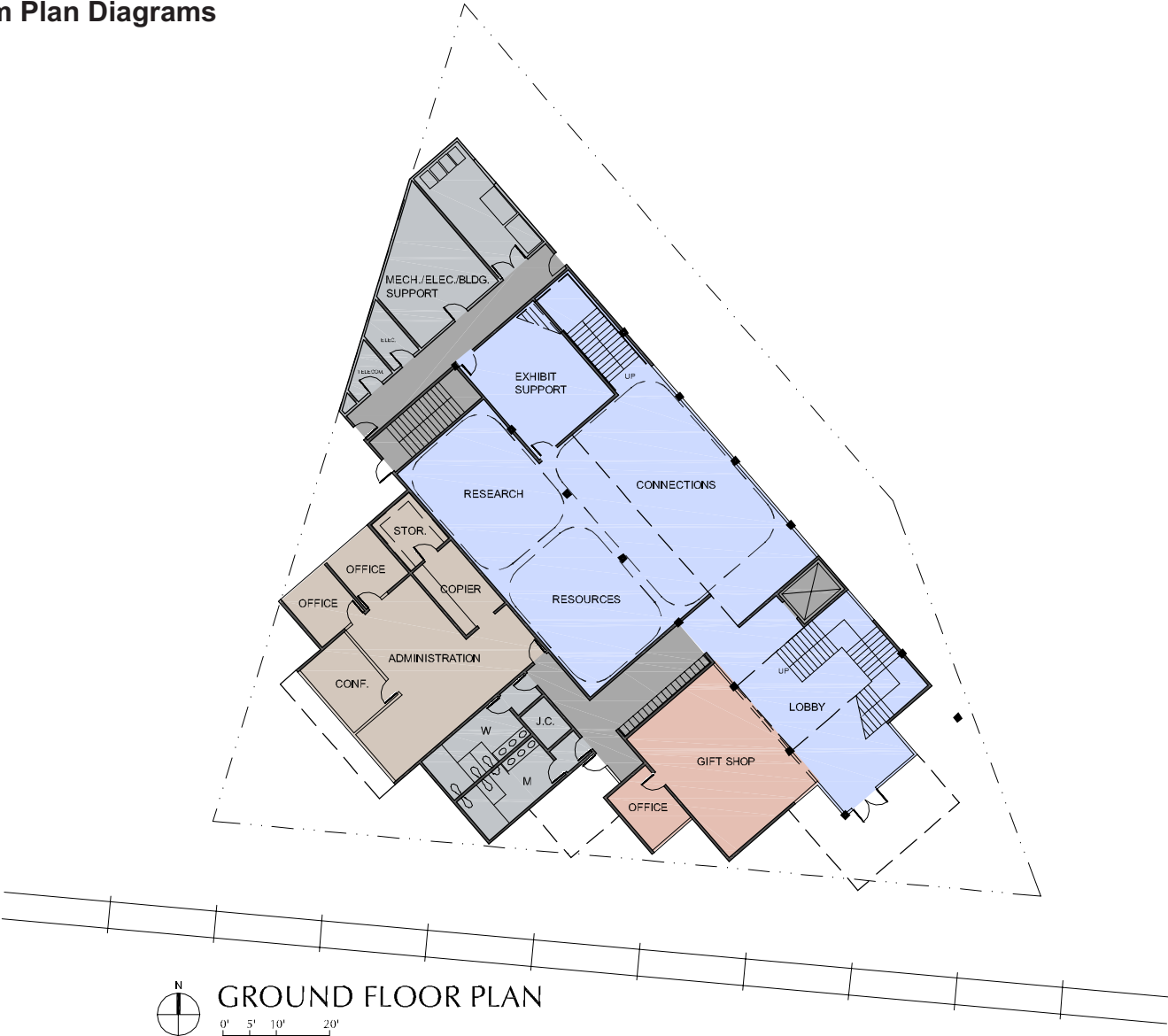


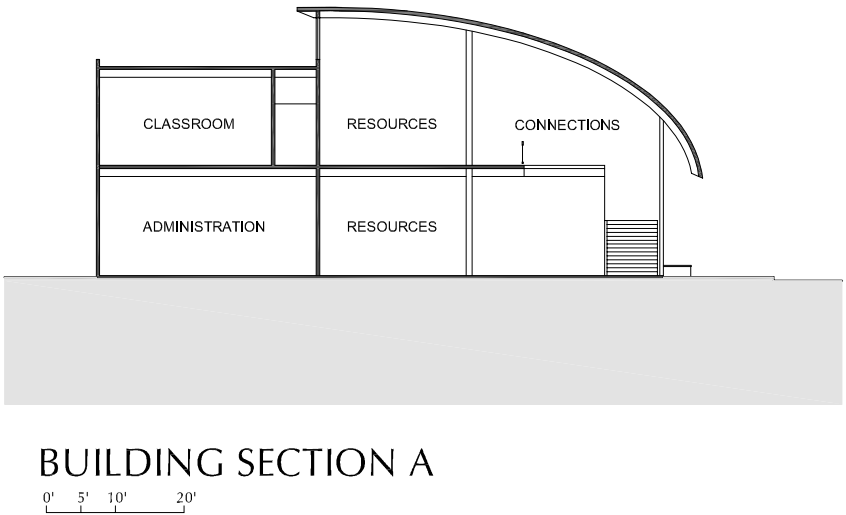
CLASSROOM



GIFT SHOP

3.5 Program Plan Diagrams





BUILDING SECTION A



A series of exterior decks from the second level exhibit and classroom spaces allow for spectacular ocean views and bridge views.

The triangular geometry of the site provided opportunities to step various building elements and to create dynamic relationships between certain programmatic spaces.

Building Massing:

The massing of the Visitor Center is defined in two linear two-story bars that align with Pacific Avenue and have southeasterly views of the Monterey Bay located directly across Beach Avenue from the site. The entry lobby is located at the southeast corner of the north parcel with direct access to a new public plaza directly across from the Municipal Wharf. Upon entering the lobby, the space opens to a two-story volume which includes the main circulation stair and elevator to the second level Introduction Exhibit. The public and highly visible exhibit rooms are located adjacent to Pacific Avenue with the two-story Connections Exhibit visible to the passing pedestrians and motorists through a large curtainwall of glass.







4.0 Room Data

Room Data Sheet - Lobby

Room No.	Room Name / Description	SF	Max. Occupancy
-	Lobby	500	72 (per CBC)

Environmental	
Lighting:	Fluorescent Direct/Indirect
Temperature:	Standard, Natural Ventilation
Humidity:	Standard
Noise:	Acoustical dampening of potential large group conversations

Fire Rating	Sprinklers
None	Yes

Finishes	
Floor:	Sealed, exposed concrete pan access floor
Base:	Painted MDF
Walls:	Painted GBD
Ceiling:	Exposed structure, acoustical clouds

Furniture	Misc. Equipment
Keyed locker storage, brochure display, bench, walk-off mat at entry	

Receptacles	
Duplex:	120v convenience
Special Use:	None
Telephone:	Yes
Data:	None

Spare Conduits					
Qty:	Size:	Type:	From:	To:	
-	-	-	-	-	

Adjacencies
Exhibits, Gift Shop, Public Restrooms

Functions
Orientation to building organization and amenities

Options/Remarks:
Views into Introduction Exhibit for ease of building orientation

Room Data Sheet - Intro Exhibit

Room No.	Room Name / Description	SF	Max. Occupancy
-	Introduction to the MBNMS	1200	80 (per CBC)

Environmental	
Lighting:	Per Exhibit Requirements, Emergency Egress Lighting
Temperature:	Standard, Natural Ventilation
Humidity:	Standard
Noise:	Acoustical dampening of potential large group conversations

Fire Rating	Sprinklers
None	Yes

Finishes	
Floor:	Sealed, exposed concrete pan access floor
Base:	Provided per Exhibit Requirements
Walls:	Provided per Exhibit Requirements
Ceiling:	Exposed Structure

Furniture	Misc. Equipment
Provided per Exhibit Requirements	Provided per Exhibit Requirements

Receptacles	
Duplex:	Conduit provided per Exhibit Requirements
Special Use:	Conduit provided per Exhibit Requirements
Telephone:	None
Data:	Conduit provided per Exhibit Requirements

Spare Conduits					
Qty:	Size:	Type:	From:	To:	
-	-	-	-	-	

Adjacencies
Lobby, Resources Exhibit

Functions
Orientation and Introduction Exhibits to the Monterey Bay National Marine Sanctuary, defining the marine sanctuary and describing the sanctuary system.

Options/Remarks:

Room Data Sheet - Resources Exhibits

Room No.	Room Name / Description	SF	Max. Occupancy
-	Resources Exhibits	1,150	77 (per CBC)

Environmental	
Lighting:	Per Exhibit Requirements, Emergency Egress Lighting
Temperature:	Standard, Natural Ventilation
Humidity:	Standard
Noise:	Acoustical dampening of potential large group conversations

Fire Rating	Sprinklers
None	Yes

Finishes	
Floor:	Sealed, exposed concrete pan access floor
Base:	Provided per Exhibit Requirements
Walls:	Provided per Exhibit Requirements
Ceiling:	Exposed Structure

Furniture	Misc. Equipment
Provided per Exhibit Requirements	Provided per Exhibit Requirements

Receptacles	
Duplex:	Conduit provided per Exhibit Requirements
Special Use:	Conduit provided per Exhibit Requirements
Telephone:	None
Data:	Conduit provided per Exhibit Requirements

Spare Conduits					
Qty:	Size:	Type:	From:	To:	
-	-	-	-	-	

Adjacencies
Introduction, Research and Connection Exhibits

Functions
Exhibits describe the geographical, biological and cultural resources above and below the water at the Monterey Bay National Marine Sanctuary.

Options/Remarks:

Room Data Sheet - Connection Exhibit

Room No.	Room Name / Description	SF	Max. Occupancy
-	Land & Sanctuary Connection Exhibit	2000	134 (per CBC)

Environmental	
Lighting:	Per Exhibit Requirements, Emergency Egress Lighting
Temperature:	Standard, Natural Ventilation
Humidity:	Standard
Noise:	Acoustical dampening of potential large group conversations

Fire Rating	Sprinklers
None	Yes

Finishes	
Floor:	Sealed, exposed concrete pan access floor, sealed concrete slab at Tide Pool Exhibit
Base:	Provided per Exhibit Requirements
Walls:	Provided per Exhibit Requirements
Ceiling:	Exposed Structure

Furniture	Misc. Equipment
Provided per Exhibit Requirements, trash receptacle	Handwash sink adjacent Tide Pool Exhibit, paper towel dispenser

Receptacles	
Duplex:	Conduit provided per Exhibit Requirements
Special Use:	Conduit provided per Exhibit Requirements
Telephone:	None
Data:	Conduit provided per Exhibit Requirements

Spare Conduits					
Qty:	Size:	Type:	From:	To:	
-	-	-	-	-	

Adjacencies
Resources and Research Exhibits

Functions
Exhibits describe the relationship between the sanctuary to the land and the land to the sanctuary, both past and present. Tide Pool Exhibit is an example of the complex ecosystem of the sanctuary and the land/sea connection.

Options/Remarks:

Room Data Sheet - Research Exhibits

Room No.	Room Name / Description	SF	Max. Occupancy
-	Research Exhibit	1,150	77 (per CBC)

Environmental	
Lighting:	Per Exhibit Requirements, Emergency Egress Lighting
Temperature:	Standard, Natural Ventilation
Humidity:	Standard
Noise:	Acoustical dampening of potential large group conversations

Fire Rating	Sprinklers
None	Yes

Finishes	
Floor:	Sealed, exposed concrete pan access floor
Base:	Provided per Exhibit Requirements
Walls:	Provided per Exhibit Requirements
Ceiling:	Exposed Structure

Furniture	Misc. Equipment
Provided per Exhibit Requirements	Provided per Exhibit Requirements

Receptacles	
Duplex:	Conduit provided per Exhibit Requirements
Special Use:	Conduit provided per Exhibit Requirements
Telephone:	None
Data:	Conduit provided per Exhibit Requirements

Spare Conduits					
Qty:	Size:	Type:	From:	To:	
-	-	-	-	-	

Adjacencies
Resources and Connection Exhibits

Functions
Exhibit displays how the sanctuary provides research opportunities for scientific discovery and management above and below the water.

Options/Remarks:

Room Data Sheet - Classroom/Public Meeting Rm.

Room No.	Room Name / Description	SF	Max. Occupancy
-	Classroom / Public Meeting Room	1,000	50 (per CBC)

Environmental	
Lighting:	Direct/Indirect with multi-level switching control, window shade control (power)
Temperature:	Standard, Natural Ventilation
Humidity:	Standard
Noise:	Acoustical performance for instruction

Fire Rating	Sprinklers
None	Yes

Finishes	
Floor:	Sealed, exposed concrete pan access floor, sealed concrete slab at wet table
Base:	Painted MDF
Walls:	Painted GBD
Ceiling:	GBD, Acoustical Ceiling Panels

Furniture	Misc. Equipment
Whiteboard, Work tables for instruction, stackable chairs	Motorized projector screen, clock, overhead projector, speakers, wet table w/ saltwater tanks

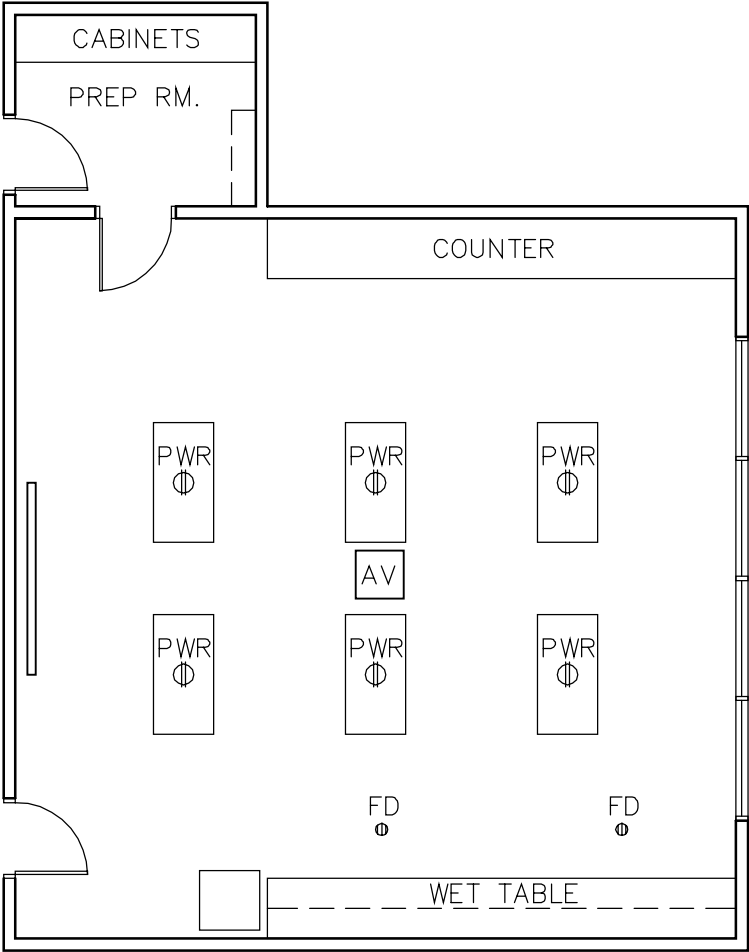
Receptacles	
Duplex:	120v convenience, (6) overhead drops
Special Use:	Overhead Electrical Outlet Drops, Overhead Projector
Telephone:	Yes
Data:	Yes

Spare Conduits					
Qty:	Size:	Type:	From:	To:	
-	-	-	-	-	

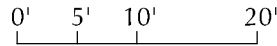
Adjacencies
Prep Area, Catering Kitchen, Storage, Public Restrooms, Access to exterior decks and exhibits, outside building entrance.

Functions
An educational classroom for K-12th grade students to offer standards-based programs and available for public meetings.

Options/Remarks:
150 SF storage room adjacent for furniture and AV equipment storage (tables, stackable chairs, (2) AV carts w/ TV/VCR/DVD, etc.)



CLASSROOM



Room Data Sheet - Preparation Rm.

Room No.	Room Name / Description	SF	Max. Occupancy
-	Preparation Room	200	2 (per CBC)

Environmental	
Lighting:	Direct Fluorescent Lighting
Temperature:	Standard, Natural Ventilation
Humidity:	Standard
Noise:	None

Fire Rating	Sprinklers
None	Yes

Finishes	
Floor:	Sealed concrete
Base:	Rubber base
Walls:	Painted GBD
Ceiling:	ACT

Furniture	Misc. Equipment
Base and upper plam cabinets	

Receptacles	
Duplex:	120v convenience
Special Use:	None
Telephone:	Yes
Data:	Yes

Spare Conduits					
Qty:	Size:	Type:	From:	To:	
-	-	-	-	-	

Adjacencies
Classroom

Functions
Allows preparation and storage of materials for instruction directly adjacent the teaching classroom.

Options/Remarks:
Long, linear room desired with approximately 20 LF of base/upper plastic laminate cabinet. Provide (2) knee wells for work areas.

Room Data Sheet - Catering Kitchen

Room No.	Room Name / Description	SF	Max. Occupancy
-	Catering Kitchen	160	1 (per CBC)

Environmental	
Lighting:	Direct Lighting
Temperature:	Ventilation adequate to control food odors
Humidity:	Standard
Noise:	Acoustic separation from classroom

Fire Rating	Sprinklers
None	Yes

Finishes	
Floor:	Sheet linoleum with integral cove base, welded seams
Base:	Integral cove base
Walls:	Painted GBD
Ceiling:	Painted GBD

Furniture	Misc. Equipment
None	Stove, dishwasher, warming cabinet, industrial coffee maker, ice machine

Receptacles	
Duplex:	120v convenience
Special Use:	
Telephone:	Yes
Data:	Yes

Spare Conduits					
Qty:	Size:	Type:	From:	To:	
-	-	-	-	-	

Adjacencies
Access to Classroom/Public Meeting Rm.

Functions
Layout and finish preparation for food catering to support events in the classroom/public meeting room.

Options/Remarks:

Room Data Sheet - Gift Shop

Room No.	Room Name / Description	SF	Max. Occupancy
-	Gift Shop	800	27 (per CBC)

Environmental	
Lighting:	Verify with leasing contract (tenant improvement)
Temperature:	Standard
Humidity:	Standard
Noise:	None

Fire Rating	Sprinklers
None	Yes

Finishes	
Floor:	Sealed, exposed concrete pan access floor
Base:	Verify with leasing contract (tenant improvement)
Walls:	Verify with leasing contract (tenant improvement)
Ceiling:	Exposed Structure

Furniture	Misc. Equipment
Verify with leasing contract (tenant improvement)	Overhead coiling grille to secure after-hours

Receptacles	
Duplex:	120v convenience
Special Use:	Security Devices
Telephone:	Yes
Data:	Yes

Spare Conduits					
Qty:	Size:	Type:	From:	To:	
-	-	-	-	-	

Adjacencies
Public lobby, exhibits, gift shop office

Functions
Retail / merchandising opportunity

Options/Remarks:
120 SF Gift Shop Office, 120 SF Gift Shop Storage

Room Data Sheet - Reception/Open Office

Room No.	Room Name / Description	SF	Max. Occupancy
-	Reception/Open Office (6 @ 80 SF)	480	5 (per CBC)

Environmental	
Lighting:	Fluorescent Direct/Indirect
Temperature:	Standard, Natural Ventilation
Humidity:	Standard
Noise:	Acoustical performance for low conversations

Fire Rating	Sprinklers
None	Yes

Finishes	
Floor:	CPT TILE on concrete pan access floor
Base:	Rubber base
Walls:	Painted GBD
Ceiling:	ACT

Furniture	Misc. Equipment
Desk, task chair, files, bookshelf	

Receptacles	
Duplex:	120v convenience
Special Use:	None
Telephone:	Yes
Data:	Yes

Spare Conduits					
Qty:	Size:	Type:	From:	To:	
-	-	-	-	-	

Adjacencies
Exhibits, Gift Shop, Public Restrooms

Functions
Open office area for (6) 80 sf workstations and reception area. Adjacent copier/printer room to allow production/assembly of printed materials. Storage for paper stock, printed materials and presentation equipment.

Options/Remarks:
120 SF storage, 150 SF copier/printer room, 50 SF staff toilet, 70 SF kitchenette adjacent.

Room Data Sheet - Educational Staff Office

Room No.	Room Name / Description	SF	Max. Occupancy
-	Educational Staff Offices (2 @120 SF)	240	3 (per CBC)

Environmental	
Lighting:	Fluorescent Direct/Indirect
Temperature:	Standard, Natural Ventilation
Humidity:	Standard
Noise:	Acoustical privacy from surrounding offices

Fire Rating	Sprinklers
None	Yes

Finishes	
Floor:	CPT TILE on concrete pan access floor
Base:	Rubber base
Walls:	Painted GBD
Ceiling:	ACT

Furniture	Misc. Equipment
Desk, task chair, files, bookshelf	

Receptacles	
Duplex:	120v convenience
Special Use:	None
Telephone:	Yes
Data:	Yes

Spare Conduits					
Qty:	Size:	Type:	From:	To:	
-	-	-	-	-	

Adjacencies
Reception/Open Office area, Conference Room

Functions

Options/Remarks:

Room Data Sheet - Conference Room

Room No.	Room Name / Description	SF	Max. Occupancy
-	Conference Room	200	14 (per CBC)

Environmental	
Lighting:	Direct/Indirect with multi-level switching control
Temperature:	Standard, natural ventilation
Humidity:	Standard
Noise:	Acoustical privacy from surrounding offices, comfortable for speech

Fire Rating	Sprinklers
None	Yes

Finishes	
Floor:	CPT TILE on concrete pan access floor
Base:	Painted MDF
Walls:	Painted GBD, vertical glazing
Ceiling:	ACT

Furniture	Misc. Equipment
Conference table, chairs	

Receptacles	
Duplex:	120v convenience
Special Use:	None
Telephone:	Yes
Data:	Yes

Spare Conduits					
Qty:	Size:	Type:	From:	To:	
-	-	-	-	-	

Adjacencies
Administrative Offices

Functions
Conference room also to be utilized for volunteer coordination and break area.

Options/Remarks:



5.0 Site Development

5.1 Site Conditions

Existing Conditions

The existing site, currently dubbed the “Fun Spot”, contains a temporary skate park and parking for approximately 20 cars. Located at the corner of Pacific Avenue and Beach Street, the property is prominently situated and highly visible from the wharf and boardwalk areas. This is a very active section of Santa Cruz with heavy vehicular, pedestrian and bicycle traffic moving to and from key attractions along the water’s edge. A key feature of the site is the Howe Truss Bridge, which borders the property to the west. The original bridge was constructed in 1918 by the Southern Pacific Railroad and was considered unusual due to its truss design. The bridge is listed in the City’s Historical Building Survey, and was recently reconstructed following NHPA guidelines and reopened in 2000 for one-way vehicular traffic, bicycle lanes and pedestrian use. The bridge was listed on the National Register of Historic Places in 1985 as part of Caltrans’ study of historic bridges in California and views of the structure must be protected.

The Fun Spot property is owned by the City of Santa Cruz and contains .70 acres. The site is mostly flat and paved with asphalt. An active rail line bisects the property, forming two distinct and irregularly shaped parcels and posing safety concerns for rail crossing. The City of Santa Cruz owns contiguous parcels of land to the west between the Fun Spot and the Howe Truss Bridge. These parcels contain steep slopes, buried utilities and overhead power lines. Their character and landscape condition will be very visible from the new Visitors Center and final plans should integrate the restoration of these parcels to create a cohesive site design for the area as a whole. It is our understanding that the overhead power lines will be placed underground as part of a separate project budget.

The Fun Spot is zoned as Parks (PK). A Visitor Center is permitted within this designation.

Surrounding Uses

The Visitor Center will be located within a district that is rich in visitor oriented facilities and recreational attractions. The Municipal Wharf, the Boardwalk, beach access, Neary Lagoon and the Depot Park are all within an easy walk from the site. A recently constructed pedestrian and bike trail links Depot Park with the site. This ADA accessible trail will also provide a direct connection to the future Natural History Museum that is planned for the Depot site. The new Visitor Center has the opportunity to be a hub of activity in the area and will offer a great location to orient visitors of other recreational, educational and natural resource destinations near the site.



Access and Circulation

The site is currently well served by vehicular, transit, shuttle, bicycle, pedestrian and recreational rail access. Pacific Avenue leads directly to the Municipal Wharf, and Beach Street is a major conduit linking the boardwalk, wharf and other key attractions located along the water's edge. During summer and peak weekend periods, the intersection of Beach and Pacific experiences traffic congestion and heavy use by pedestrians, bikers and vehicles. It is recommended that improvements be undertaken to improve traffic flow and pedestrian safety at this vortex of activity. Intersection improvements should be coordinated with the site design for the Visitor Center to enhance the flow of movement and integrate paving material choices.

Bicycle transport is very popular in Santa Cruz and the site is served by a major bicycle route along Beach Street, as well as bike lanes along West Cliff Road. The Santa Cruz County Transportation Management Association operates an ongoing electric-assisted bicycle program that has put more than 2,200 electric bicycles and scooters on the road in Santa Cruz County. An electric charging station located at the new Visitor Center could provide a desirable amenity for this user group.

Parking

The Fun Spot site currently contains approximately 20 spaces for vehicles. However, access to this lot is from the corner of Beach and Pacific, which is an unsafe and undesirable ingress point. Steep slopes along Beach Street make access further away from the corner problematic. On-street parking is available along Beach Street and several public parking venues are available throughout the vicinity. Approximately 214 spaces will be available as part of the Depot Site Master Plan, there is potential for a new public parking garage as part of the Coast Hotel

project and a large surface lot provides a significant volume of parking for the Boardwalk area. It is recommended that the parking demand for the new Visitor Center be accommodated through the existing and proposed public parking facilities in the area. Visitors should be encouraged to park and explore the host of key attractions in the vicinity by foot or by bicycle. The Visitor Center will serve as one of a chain of attractions that can be explored in the area.

In summer months a beach area shuttle service serves the Santa Cruz County Headquarter Building on Ocean Street as well as the Boardwalk parking lot. The shuttle service is scheduled to be expanded to serve the Coast Hotel parking structure if that project comes on line.

Railroad

A freight rail line travels along Beach Street adjacent to the Boardwalk and then bisects the Fun Spot site. Freight traffic operates approximately three days a week with twice a day service on those days. According to the AMS Planning and Research Report of July 2003, "the trains run on weekdays and typically travel northbound through the area around 1:00 PM and southbound around 4:00 PM. The Roaring Camp/Big Trees Railroad (RC/BT) operates seasonal recreational trains twice a day between June and Labor Day, with weekend service in May and September-October. Trains travel approximately 5 miles per hour with an estimated ridership of 200-500 persons per trip."

With the railroad bisecting the Visitor Center site, a pedestrian crossing point will need to be approved by Union Pacific and Big Trees rail lines. Work on the site will also need to incorporate noise mitigation measures and maintenance requirements for improvements within the railroad ROW. If structures are

incorporated over the tracks a minimum clearance of 22'6" is needed. Normal on-grade crossings are 20' wide, with fencing, flashing warnings and gates. It may be possible to work with the railroad to design a crossing that blends more closely with the plaza design and integrates audible bells or bollards in the pavement to alert pedestrians about oncoming trains.

The site also contains railroad signal equipment that is prominently located by Pacific Avenue. Relocation of this equipment must be coordinated with the railroad to insure maintenance and security requirements are addressed.



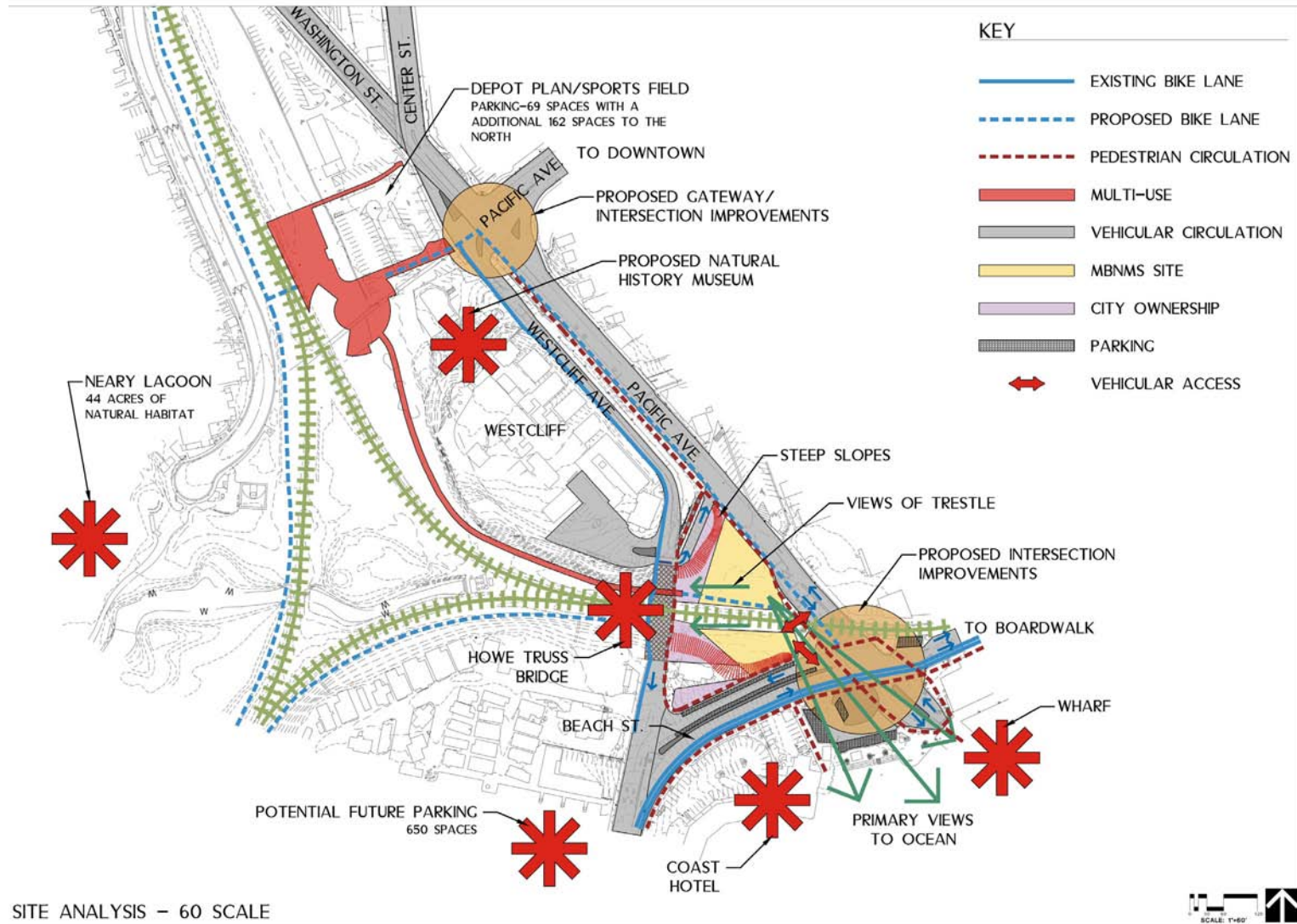
Views

Due to the highly visible nature of the site, views to and from the property will be a key consideration. The City General Plan limits building height to 50 feet. The building should be sited and designed to minimize obstruction of public views both from the Trestle Bridge and West Cliff neighborhood toward the ocean as well as views toward the Bridge from the Wharf area. Plant material must additionally be selected carefully to protect view corridors in and out of the site.

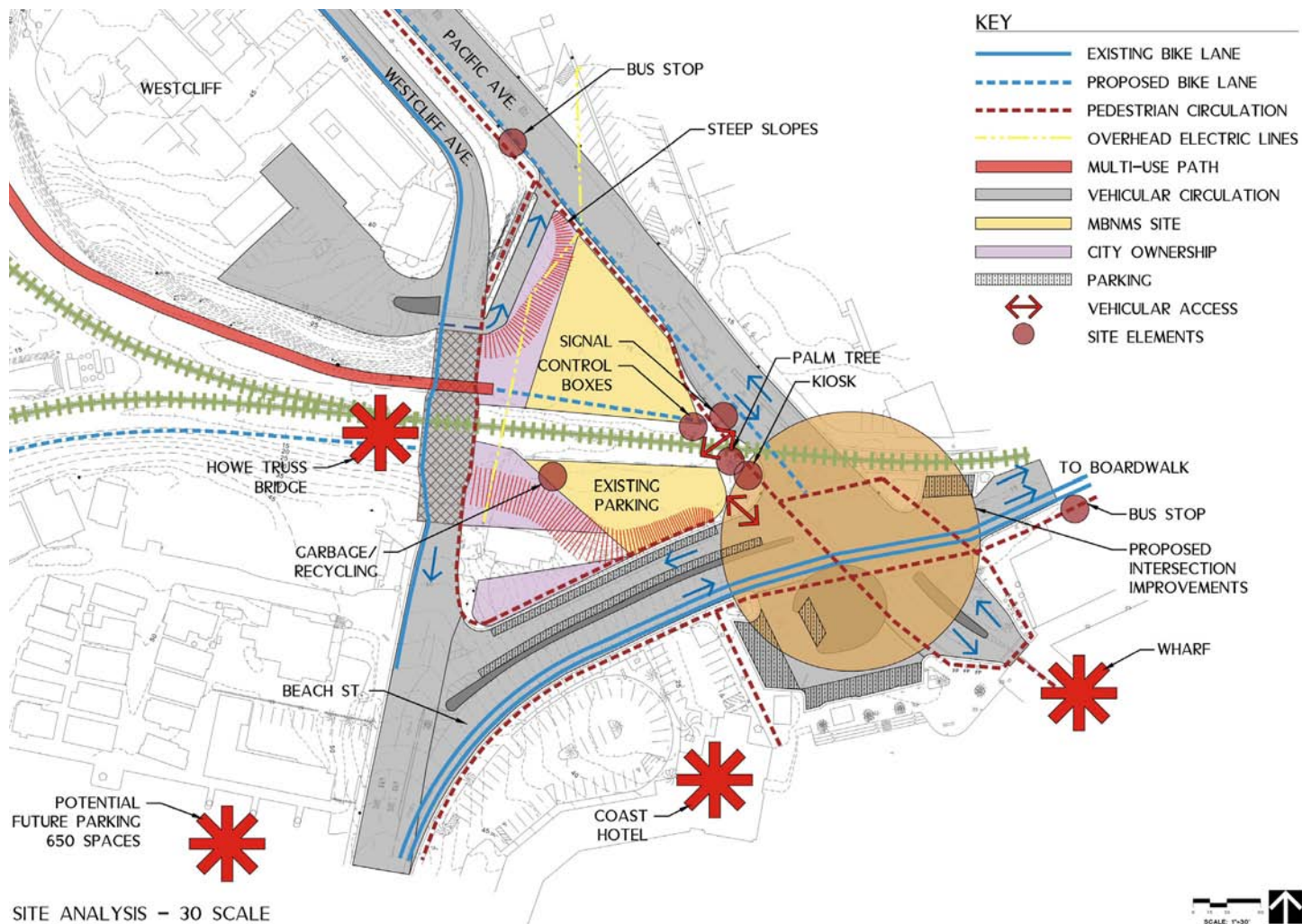
Views from the new Visitor Center toward the offshore National Marine Sanctuary will be critical to enhance the visitor experience and connection with the resource that is being interpreted. Views of the ocean are not visible from the ground plane of the site and a second story viewing elevation will be necessary to provide an ocean vista.



5.2 Context Analysis Diagram



5.3 Site Analysis Diagram



5.4 Site Opportunities and Constraints

A summary of the opportunities and constraints affecting site development for a new Visitor Center is outlined below.

Opportunities

- Prominent location within close proximity to key Santa Cruz destinations
- Highly visible from the Beach Boardwalk area
- Parking facilities can be shared with the Coast Hotel and Depot projects
- Site is served by city utilities
- Good vehicular, bus, pedestrian and bicycle access
- Good connectivity to existing pedestrian/ bike path to Depot Park and the future Natural History Museum project
- Site offers a blank slate for redevelopment
- Good opportunities for site restoration, storm water management and site educational features
- Visitor Centers are permitted within the PK zoning classification

Constraints

- Irregular shaped parcel limits site layout options
- Vehicular ingress/egress to the site is difficult
- Site is bisected by an active rail line posing safety concerns
- Views to and from the trestle must be maintained
- Site is disconnected from the shoreline/MBNMS
- Clear views of the ocean and wharf are only possible from an upper story
- Potential geologic/seismic hazards
- 50' height limit on structures
- Additional archeological review needed for a portion of the site
- CEQA/NEPA environmental review is required
- Phase II environmental site assessment may be needed to further evaluate the presence of soil contamination



5.5 Site Development Plan





6.0 Building System Narratives

6.1 Architectural Design Narrative

One of the project goals is to be a LEED certified project. Material selection considerations will be prioritized to include recycled content, manufactured and/or harvested regionally, originating from rapidly renewable resources and select woods from environmentally responsible managed resources. Products with low volatile organic compounds (VOC) content will be used for adhesives, sealants and paints.

Exterior Materials:

Siding: A panelized system of metal or wood wall panels will be developed to clad the exterior vertical wall surfaces. The walls will be constructed of metal studs with gypsum wall board at interior and plywood, building felt and wall panel product for the exterior. Products being considered for the wall panels are a painted galvanized steel articulated rib panel (i.e. Galvalume) or horizontal wood siding. The exterior panels will be framed by 1/4" thick painted galvanized steel shapes. Metal panel structural covers and copings shall be .125 painted aluminum on metal stud strong back clipped to structure.

Flashing materials shall be 24 gauge painted galvanized steel where exposed and stainless steel where concealed.

The windows will be a contractor designed glazed aluminum curtain wall and storefront systems (depending on location) with painted finish. Glazing will be insulated high performance with Low-E coating. Operable windows shall be awning type. All window flashings shall be stainless steel.

Doors: Entrance doors in storefront shall be heavy stile aluminum with painted finish. Doors not in storefront shall be 16 gauge Grade III extra heavy-duty pre-finished steel with G90 zinc coating. The entrance doors shall be equipped with power-actuated door hardware for ADA accessibility.

Roofing: The roof coverings shall be of the following types:

Curved, sloped metal roof shall be raised seam zinc-coated steel panel on average R-20 nail base insulation.

Green roof (at classroom) shall be a system which provides a waterproof membrane, a root barrier, a layer of insulation, a drainage layer, a filter fabric for fine soils, the engineered growing medium and the plant material. A shallow layer of gravel will be placed from 18" within the outside perimeter of the roof for additional drainage and roof maintenance.

Low sloped roofs (at mechanical areas) shall be built-up bituminous roofing with Energy Star cap sheet on average R-20 expanded polystyrene tapered insulation.

Roof gutters, downspouts and flashings shall be painted zinc. The interior of gutters to be coated with bituminous paint. Gutters and downspouts shall be minimum of 22 gauge; downspouts shall be a minimum of 4" diameter. Flashing shall be 24 gauge.

Exterior Decks will be constructed of steel structural supports with wood plank decking or concrete deck.

Interior Materials:

Floor Finishes: In all non-wet areas, the floor will be comprised of a pedestal access floor systems with modular lightweight concrete-filled, formed-steel panels to allow for an underfloor air distribution system and greater flexibility of electrical and cable management. In public areas, the natural patina of the concrete will be exposed and sealed. In the Administrative Offices, carpet tiles will be utilized that contain recycled content and low VOC materials. The restrooms will have ceramic tile. The Catering

Kitchen will have linoleum flooring with integral cove base.

Wall finishes: Ceramic tile will be provided at all toilet rooms and painted gypsum board finish elsewhere. At the Janitor's Closet a 4' high wainscot of fiberglass reinforced panel (FRP) will be provided.

Interior Doors: All interior doors to occupied rooms will be 1-3/4" solid core painted wood doors. Utility room doors shall be 16 gauge Grade III extra heavy duty pre-finished steel for additional durability. A coiling enclosure grille gate shall be provided at the Gift Shop entrance for security after-hours to public lobby.

Ceiling Finishes will be minimal. The public lobby area will have a suspended acoustical wood ceiling. Acoustical lay-in tile ceiling will be provided at the Administrative offices and classroom. Gypsum wall board ceilings will be installed in the public restroom.

Plastic laminate casework for base and upper cabinets will be located to provide storage in the classroom, prep area, kitchens and copier areas.

Key-operated lockers will be available for public usage off the main lobby.

The elevator will be a 2500 pound, 125 fpm hydraulic passenger elevator. The elevator finishes for the interior cab will include rubber tile flooring, embossed metal wall panels with stainless steel handrails and stainless steel ceiling with halogen lights.

The interior stairs in the public areas will be of steel construction with wood plank treads and bent metal risers. The guardrails will be constructed of vertical steel pickets and stainless steel handrails. The rear exit stair will be a conventional design-build steel and concrete pan tread stair.

6.2 Structural Narrative

The proposed new Visitor Center for the Monterey Bay National Marine Sanctuary, located across from the Santa Cruz Boardwalk, is a two-story facility of approximately 16,000 sq. ft. The structural skeleton consists of wide flange steel beams at 8 ft. on center, and girders supported by wide flange steel columns. The approximate tonnage of structural steel for a building of this size is 160 tons.

Second floor deck is a composite slab, consisting of 3½" normal weight concrete fill over 3" deep – 18 gauge corrugated steel deck, supported over steel framing. Rebar steel to be #4 bars at 12" o.c. each way. Roof decking is non-composite 1½" deep – 18 gauge corrugated steel deck supported by steel framing. Areas where roof framing is exposed to view, it may consist of ½" plywood over 2x6 tongue & groove decking supported by glu-laminated beams or steel beams.

Foundation system may consist of continuous perimeter footings and isolated interior spread footings under columns. 6" slab-on-grade over 2" sand, vapor barrier and 5" free draining crushed rock is assumed. Rebar steel to be #4 bars at 12" o.c. each way.

Seismic Lateral Force Resisting System consists of well distributed Concentric Steel Braced Frames in both orthogonal directions (North-South and East-West). Based on floor plate layout/configuration and two levels of roofs, the seismic system of the building requires sixteen (16) Braced Frames of varying lengths.

6.3 Mechanical System Design Narrative

Heating, Ventilating and Air Conditioning

The following standards and codes will be followed:

ASHRAE, SMACNA, NFPA, California Building Code, California Mechanical Code, California Plumbing Code & California Fire Code and NEC.

GENERAL

Four options are being considered for the heating, ventilating and air-conditioning (HVAC) systems of the Center:

- a. Chilled water system with underfloor air distribution
- b. Water source heat pump
- c. Variable refrigerant volume.
- d. Packaged gas/electric rooftop units.

DESIGN CRITERIA

1. Outdoor Design Criteria
 - a. Summer Outdoor Design Conditions 87 °F DB, 65°F WB
(ASHRAE 0.1%)
 - b. Design Wet Bulb 66°F WB
(ASHRAE 0.1%)
 - c. Winter Outdoor Design Conditions 37 °F DB
(ASHRAE 0.2%)

2. Indoor Design Criteria

Heating Indoor Design Temperature 70°F DB

Cooling Indoor Design Temperature 75°F DB

3. Outside Air Quantities Per California Building Code

All occupied areas: 15 CFM per person

4. Exhaust Air Quantities

Restrooms 2 CFM per Sq. Ft.

Janitor's Closet 2 CFM per Sq. Ft.

HVAC Option 1: chilled water system with underfloor air distribution

Cooling will be provided by a 50 ton water cooled chiller and a cooling tower. Two chilled water and two condenser water pump will be provided.

As an option, the chilled water system will be connected to cool roof spray system consisting of water distribution and spray system on the roof, a 10,000 gallon chilled water storage tank and a sand filter. Water will be sprayed onto the roof at night when the sky temperature is low enough to reduce the water temperature to a level usable by the chilled water coil of the main air handling unit.

Main air handling equipment will consist of a 25,000 cfm chilled water variable air volume air handling unit in an interior mechanical room. The unit will be configured for cooling only

and architectural louvers in the mechanical room outside walls will provide a source for economizer air to the AHU. Exhaust louvers at the exterior wall of the occupied areas will provide relief path for the economizer system. Supply fans will be controlled by variable frequency drives regulated by a static pressure sensor located in the raised floor.

Supply air will be provided through the underfloor plenum and air distribution will be through an "air highway" which consists of a 3 sided duct, with the floor slab acting as the 4th surface of the duct. Motorized dampers will be provided for each floor to modulate the amount of air supplied to each floor and to maintain a constant plenum pressure. Heating will be provided by underfloor fan powered terminal units ducted to slot diffusers.

A split type air conditioning unit will be provided for the after hours air conditioning of the Classroom.

HVAC Option 2: Water Source Heat Pump

Ceiling mounted water source heat pump(s) will provide cooling and heating for each space, while the heat pumps will be piped in a closed water circuit with a condensing type heating hot water boiler and a closed circuit cooling tower which will inject heat into the system or reject heat from the system respectively.

HVAC Option 3: Variable Refrigerant Volume

The system consists of ceiling mounted indoor units and outdoor heat pumps and is capable of providing simultaneous heating and cooling for the zones served by each outdoor unit. The outdoor unit's compressor is controlled by a variable frequency inverter drive and capacity control for the indoor units is achieved by varying the flow of refrigerant to the indoor unit. Each outdoor unit is approximately 8 tons and may be connected to up to 16 indoor units. It is anticipated that 8-9 outdoor units would be required.

Indoor units will be ducted type, concealed in the ceiling plenum. Fresh air will be ducted to the return air duct of concealed units.

Indoor units will be equipped with condensate drain pump, when required.

The VRV system will be provided with remote controllers capable of monitoring and scheduling of all indoor units.

HVAC Option 4: Packaged Rooftop Unit

The HVAC equipment for the Center will consist of a variable volume packaged rooftop air conditioning unit, variable air volume boxes and a heating hot water boiler.

The rooftop unit will have economizer control and be provided with supply and return fans controlled by variable frequency drives in response to duct and building static pressure respectively.

The rooftop unit will supply air into a medium pressure supply ductwork wherefrom air is supplied to variable air volume terminal units with hot water reheat for perimeter zones.

A split type air conditioning unit will be provided for the after hours air conditioning of the Classroom.

A 750 MBH condensing type heating hot water boiler and a circulating pump will provide hot water for the VAV box reheat coils.

BUILDING MANAGEMENT SYSTEM

Environmental controls for all mechanical options, except for the VRV system, will be fully DDC, BACnet compatible computerized Building Management System. The system will be PC based and will include color graphic representation of mechanical

and electrical building systems. The BMS software will include scheduling operation of mechanical equipment, alarm and logging (data file and/or printed) of events. Room thermostats will be remotely resettable and concealed or locking type in public areas.

PLUMBING AND FIRE PROTECTION

DOMESTIC WATER SERVICE

The street utility mains will supply water requirements for the project by dedicated fire and domestic water lines to the building. The flow requirements will be based on code requirements, fire protection criteria and building demands. Maximum peak projected 70 GPM of total domestic cold water load.

Domestic hot water will be provided by a gas fired water heater, with 100 gallon storage capacity, located in the boiler room.

SANITARY SEWER SYSTEM

The sanitary system will be designed in accordance with criteria derived from the applicable local codes, standards and the California Plumbing code. Projected maximum peak load of 60 GPM for the building. The sanitary / vent drainage system will be routed out 5 feet from the building for connection to the site drainage system.

STORM DRAINAGE SYSTEM

The storm drainage system will consist of roof drainage and perimeter gutters & downspouts that will be routed 5 feet from the building for connection to the site drainage system. Sizing of the storm drainage system will be based on local rainfall density. Projected maximum peak load of 180 GPM.

NATURAL GAS SYSTEM

Natural gas will be supplied by the local provider through to the gas meter, where it will be distributed through the building to all equipment using fuel gas. Projected maximum peak load of 950 CFH for space heating and domestic hot water heating.

FIRE PROTECTION

A dedicated fire service will be provided through the site distribution system consisting of a connection to the street fire main, double detector check, post indicator valves, and fire department pumper connections. The building will be protected by a sprinkler system fed from the street fire main and electrically monitored at the building's Fire Alarm Control Panel.

6.4 Electrical System Design Narrative

All electrical systems shall be designed in accordance with all applicable regulations, codes and standards, including the latest edition of the National Electrical Code, State of California Titles 19 and 24, and local municipal codes and regulations.

The project may pursue LEED accreditation through the implementation of the most sustainable and efficient electrical and lighting systems available. Electrical enhancements may be provided to include a solar photovoltaic (PV) system to generate electricity on-site and a daylight harvesting control system to automatically dim artificial lighting in the building when sufficient day light is available in each zone.

The PV system will be provided to provide renewable energy at the site:

Based on the proposed design and the size of the new building, a nominal 10KW (peak output) rated system on approximately 2,000 square feet of available roof area will be installed. The system will use standard crystalline PV panels or amorphous silicone panels installed flat on top of the building roof system. The resulting positive effects on the environment are realized by the reduced pollution directly related to outside energy production. The facility operation and energy costs will also be reduced significantly.

The system shall be a non-storage type (with no batteries) and shall be directly connected into the Main Switchboard with a suitable "knife switch" disconnect located within 10 ft. of the main service utility disconnect. The purpose of the disconnect is to allow a single point of disconnection of the PV system if required by the utility company.

The system panels shall be standard crystalline type or amorphous silicon (to be determined). DC wiring shall tie all panels together into a single DC combiner panel to be located in the Main Electric Room. Additional system components shall include a DC disconnect/breaker, utility interactive inverter, an AC disconnect / breaker, an isolation transformer rated for the full AC load of the system, an electronic sub-meter and related monitoring components, and a tie-in to the main electric service.

The system shall be commissioned under full compliance with utility company regulations for interconnection with the utility grid. The system shall use "net-metering" to allow credit of all generated power against each monthly bill at the retail rate (using a bi-directional utility meter)

An additional part of the building enhancement effort will include the implementation of a Daylight Harvesting System. By lowering the lighting levels when adequate natural illumination is available, energy savings from both lighting and air-conditioning reductions (due to the lower emitted heat from less artificial lighting wattage) can be appreciated each day.

The system shall include zones for each specific daylight zone subject to separate control. Strategically placed photosensors shall monitor the active light levels within each space (at the work surface) and automatically adjust the related dimmable fluorescent fixtures in the affected area in response to variable daylight contribution.

The system shall require no human intervention once properly commissioned other than allowing human override if required.

The system shall allow for inter-tie and monitoring of each zone from a central location in a network style.

As part of the sustainable design practice, the building will also utilize a raised access floor system throughout. Accordingly, all electrical feeders and branch circuits shall be routed below the accessible access floor on the structural floor slab. All conduits shall be installed on metal channel supports and routed parallel to building structure lines, as specified elsewhere in this section. Conduits are not intended to be run horizontally in floor slabs or ceiling areas, except as required, in order to allow future access and a more economic installation.

The scope of the electrical work shall include all materials, labor, equipment, services and incidentals necessary to install the electrical work complete, including but not limited to the following (refer to items 1.07 through 1.14 below for detailed descriptions):

New electric utility service, including:

Underground utility high voltage power service raceway extensions from the existing power utilities located at the perimeter of the project to a new exterior pad-mounted transformer (location TBD).

Transformer pad (90" x 106" max) and associated grounding (for transformer by utility company).

Underground utility company 208V service conduits from the new transformer to a new main switchboard and meter to be located in the main electric room on the first floor.

New underground telephone service raceway extensions from the existing telephone utilities located at the perimeter of the site to a new main telephone terminal backboard to be located in the main telecommunications closet.

New underground cable television service raceway extensions from the existing underground cable tv utilities located at the perimeter of the site to a new cable television terminal backboard to be located in the main telecommunications closet.

120/208V power branch circuit panel boards, including special panels with integral transient voltage surge suppression (TVSS) equipment for computer and other sensitive loads, feeders, branch circuit wiring, wiring devices and connections to all equipment requiring electrical service.

Lighting fixtures completely lamped.

Low voltage relay lighting control system (Title 24 compliant).

Emergency and exit lighting, including integral emergency battery ballast back-up for 90 minute operation in selected fixtures, as required by code (in the path of egress).

Flush mounted "raised access floor" power and telecommunications boxes for branch power and telecommunications wiring distribution throughout the building raised access flooring system. Raised floor power and signal equipment to include MC power cable extensions to under floor power j-boxes located at each building bay. All penetrations in the raised access floor system shall be sealed to maintain the under floor air-plenum.

Supplemental telephone, cable TV, and data communications system raceways throughout the building (where required for wall terminations). Each wall outlet location to be fed with conduit runs stubbed out to below the raised access floor and sealed to maintain the under floor air-plenum.

Mechanical equipment power connections, including starters, fuses, motor rated switches and disconnects. The building will be fully air-conditioned via the raised floor system.

Building wide fire alarm system, including sprinkler monitoring and off-site reporting.

Electric service and distribution equipment:

A new 800 Amp, 120/208 Volt, 3-Phase, 4-Wire electric service shall be obtained to serve the new building.

A new Main switchboard shall be installed in the main electric room. The Main Switchboard shall be rated at 800A 120/208V 3PH 4W with an underground pull / meter section, and a full-height distribution section with main breaker. The main switchboard and all devices in the main switchboard shall be braced for and rated to interrupt the available utility company fault current at the point of service (to be determined by the utility company). Series ratings shall be allowed when documented by the UL series rating test data.

All switchgear and distribution equipment throughout the project shall be seismically braced.

The elevator and large HVAC system loads shall be fed directly from the main switchboard distribution section.

Smaller HVAC system loads shall be fed from a dedicated HVAC system branch panel board.

Fluorescent lighting shall be fed from 120/208V branch panel boards located on each floor, via low voltage relay lighting control panels.

Computer, telephone, data communications, TV, audio-visual, and other sensitive electronic loads shall be fed through dedicated receptacles located as required throughout the facility. These sensitive loads shall be connected to dedicated 120/208V 3PH 4W "clean" power branch circuit panel boards. "Clean"

power panels shall be equipped with integral transient voltage surge suppression systems.

Neutral bussing and conductors for distribution equipment and TVSS protected branch panels shall have 200% rated neutrals to accommodate for harmonic currents generated by electronic power supplies.

Branch circuit panels shall be general-purpose type, surface mounted with bolt-on type circuit breakers. All devices 10,000 A.I.C. series rated with the upstream device to meet the available fault current as determined from fault study and service entrance A.I.C..

Grounding: System grounding shall include UFER type grounding cable in the foundation slab, supplementary ground rod(s) at the main service entrance, connection to building steel and cold water service entrance, and ground wires in all feeders and branch circuit conduits throughout the project. Conduits shall not be used for equipment grounding path. The under floor metal support structure shall be bonded together with a #12 bare copper ground wire on a 30 foot square pattern.

Telephone service:

Telephone service shall be extended from the existing facilities at the project perimeter to the main telecommunications closet. Conduits shall allow for both copper and fiber optic service conductors (present and future).

The entire interior wall surface of the telecommunications closet shall be covered with 3/4" marine grade, fire treated plywood. A designated 6-foot wide portion shall be reserved for the telephone service main termination point.

Cable Television service:

Cable TV service shall be extended from the existing facilities at the project perimeter to the main telecommunications closet.

A designated 2-foot wide portion of the backboard shall be reserved for the CATV service main termination point.

Lighting:

General:

Lighting systems shall meet or exceed the new 2005 California Title 24, Part 6, requirements (as of October 1, 2005) for energy efficiency in non-residential buildings.

Lighting systems shall provide maintained illumination levels as recommended by the Illuminating Engineering Society of North America (IESNA), unless otherwise noted.

Lighting fixtures shall utilize the most energy efficient equipment available, including high-frequency electronic ballasts, T8 linear fluorescent lamps, and/or compact fluorescent and biax fluorescent lamps, and high color rendering ceramic arc tube metal halide lamps for special display applications, using solid state electronic ballasts, etc.

Interior lighting shall utilize energy efficient light sources including compact fluorescent, improved color-rendering linear fluorescent, halogen incandescent, and high color rendering ceramic arc tube metal halide lamps.

Care will be taken to appropriately balance the luminance ratios between task and ambient lighting in all areas.

Lighting Controls:

A programmable low voltage relay switching system shall be provided for control of all lighting systems (interior and exterior) at the Building.

The system shall include networked relay panels, local low voltage switches in designated rooms, and 365-day astro-dial, electronic, multi-channel time clock.

The system shall support true Lon-Works interface to allow communications with the building HVAC control system and shall include a web based interface in addition to the standard hardware functions.

The system shall allow for remote and Internet control through a secure interface.

Local wall and ceiling mounted occupancy sensors shall be utilized in all restrooms, storage rooms, janitor closets, and other transitory rooms to maximize energy efficiency. Loads on occupancy sensors shall not be controlled by the relay control system. Electric, telephone, and mechanical closets shall not utilize occupancy sensors to avoid inadvertent "off" cycles while personal are working in the spaces.

Daylight Harvesting System:

A closed loop daylight sensor and automatic control (daylight harvesting) system shall be installed in all area where adequate daylight is available to supplement artificial illumination. Refer to item 1.04 above for a detailed description of the system.

Emergency lighting and exit signs: Emergency lighting shall be provided throughout the path of egress with selected fixtures using integral emergency battery back-up ballasts. Emergency lighting shall provide an average of 1-foot candle of illumination at the floor level in the path of egress. Selected fixtures shall be

designated as "night light" fixtures for 24 hour security lighting.

Raised Access Floor System Electrical Components:

A system of flush mounted access floor power and signal boxes shall be installed throughout the facility to provide all power and communications outlets from the raised floor system.

The floor boxes shall be accommodated with a nominal 6" x 8" pre-manufactured cutout in the 2' x 2' floor panels used for the floor system. Boxes shall "drop" into place from above the floor with a self flange/trim cover and secure in place with two screw adjusters hidden below the access hatch.

Access hatches shall open to a 4-gang concealed service outlet box with (2) duplex outlets and (2) tel/data outlet gangs. Access hatches shall have notched wire management key-holes for wire passage with hatch shut.

Power for the floor system shall be evenly distributed throughout each floor via a series of hard-wired underfloor distribution boxes installed directly on the slab. Boxes shall be connected to the serving branch panel board with multi-circuit MC cable homerun whips (no hard conduit). One underfloor j-box shall be provided for each building bay (max. 30' x 30' grid). J-boxes shall consist of a pre-wired factory assembled modular power distribution unit for plug-in connection of modular wiring whips (from boxes and panel boards).

Each raised access floor box shall be wired with a pre-manufactured 20 ft. MC cable assembly to the nearest underfloor distribution j-box. MC cables shall be modular plug-in type connector at both ends for modular connection to the floor boxes and under floor distribution boxes.

Raised access floor boxes shall be easily relocatable without the use of an electrician within a 20 ft. radius of the associated underfloor distribution j-box. Each underfloor distribution j-box shall be capable of accepting up to (8) hard-wired connections.

Floor boxes to be pre-wired "Wiremold" type or equal with minimum (2) 20A duplex outlets and (2) blank tel/data compartments with activation bezels.

All penetrations of the raised access floor system (i.e. at electric closets, transitions through walls or slabs, etc.) shall be sealed to maintain the under floor plenum.

Branch Circuits:

All lighting loads shall be connected to circuit breakers in the 120/208V branch circuit panel boards via the lighting control relay panels.

All convenience power loads shall be connected to circuit breakers in the 120/208V branch circuit panel board.

All computer power loads shall be connected to circuit breakers in the 120/208V "clean" power branch circuit panel boards (with TVSS protection).

Large Mechanical loads shall be connected to 208V-3 phase distribution breakers in the Main Switchboard.

Branch circuit conductors shall be minimum #12. Minimum conduit size shall be 1/2".

All wiring under floor system shall be MC cable (UL listed and approved for use in an under floor plenum).

Mechanical Control and Interface wiring:

All Mechanical controls, control wiring and final connections are to be provided by Division 15. Conduits shall be provided by Division 16 contractor as required or indicated.

Fire Alarm System:

The facility fire alarm system shall be State and Local Fire Marshal approved, fully addressable, class B wiring throughout, with emergency battery backup as required by code.

Duct detectors shall be provided by Division 16 for any supply fans 2,000 CFM and above, installed by Division 15, connected complete by Division 16.

Ceiling mounted smoke detectors shall be provided in all electrical and storage rooms. Ceiling mounted heat detectors shall be provided in the mechanical rooms. All device coverage to be per NFPA guidelines.

Connections for fire sprinkler flow switches, valve supervisory switches, and P.I.V. valves (provided and installed under Division 15) shall be provided under Division 16.

Provide a central station connection for off-site monitoring and a remote annunciator mounted at the main entrance.

All fire alarm system wiring shall be in conduit or suitably rated (plenum) fire alarm wire.

Wall mounted horn/strobes shall be installed throughout the facility as required by code to provide both audible and visual alarm notification.

Wall mounted manual pull stations shall be installed at all exits as required by code.

Fire/Smoke dampers shall be provided with integral duct detectors by Division 15 and have stand-alone control. Division 16 shall provide 120V power for each damper/detector assembly and monitor each detector for alarm and trouble.

6.5 Landscape Design Narrative

Site Goals

A major goal of site development is to provide a welcoming setting for the MBNMS Visitor Center that accommodates crowds of visitors, responds to site constraints and creates an educational setting for a range of community functions. Site improvements should also represent a model for environmentally sensitive development by restoring degraded areas with native plantings and utilizing green construction strategies to the greatest extent possible.

The following objectives were used to guide site development:

- Incorporate the entire site as part of the exhibit.
- Provide for strong pedestrian and bicycle connections to the waterfront area, Depot Park and Neary Lagoons.
- Create a flexible plaza space that can be adapted to many possible functions.
- Maximize view opportunities toward the Howe Truss Bridge.
- Incorporate environmentally sustainable materials and strategies in site development.

Conceptual Site Plan

The 15,000 SF MBNMS Visitor Center building has been strategically placed on the north side of the railroad to maximize view orientation to the Marine Sanctuary while minimizing visual obstruction of the Howe Truss Bridge. A large south-facing plaza flows out of the building, providing a generous area for visitors arriving in groups or queuing up for special events. Key organizing elements of the plaza are the curvilinear patterns in the pavement. The patterns are intended to create a playful, flowing feel and be reminiscent of water ripples, wave patterns or the spiral forms of nautilus shells. Interpretive themes from

within the building will be drawn out into the plaza through the use of linear paver bands inscribed with quotations, historical facts or other narrative relevant to the Marine Sanctuary exhibits. It is expected that a strong flow of visitors will walk to the site from the Wharf and Boardwalk areas and the plaza has been extended south of the railroad to receive this flow. The one existing tree on the site – a lone palm has been integrated in to the plaza design and serves as a towering beacon.

School groups visiting the Center by bus will be allowed to drop off at a designated spot on Pacific Avenue. One ADA van space has been provided at this location as well. During off- hours this bus zone will be used for service vehicles for garbage collection, recycling and other maintenance needs.

South of the railroad, the site has been restored into a community park and gathering area. The generous plaza will allow space for vendors to set up and an orientation kiosk will be integrated to help direct visitors to other nearby destinations. Just west of the plaza the paved parking area has been converted into a grassy amphitheater. Seating for the amphitheater will be bunkered into the hillside. Due to the steep landforms along Beach Street, this portion of the site is protected from road noise and, thus, provides an ideal setting for outdoor classrooms or small community functions. The open portion of the amphitheater will be structured to support fire or other emergency vehicles. To the west of the amphitheater a native plant garden has been integrated providing opportunities for more solitary exploration and discovery.

The railroad cuts a prominent swath through the site and the site plan proposes to mitigate its impact to the greatest extent possible. In the plaza area paving materials would be integrated into the rail right-of-way (ROW) with special warnings lights or bollards integrated into the pavement. The remainder of the rail ROW has been narrowed, leaving a 20-foot clear zone,

centered on the rail alignment. Beyond the clear zone low shrubs have been integrated to provide a visual buffer and discourage indiscriminate pedestrian movement across the tracks.



6.6 Civil Design Narrative

The following is a brief description outlining the existing utilities available to the site

Water Service:

Water service to the site is provided by the City of Santa Cruz Water Department through existing water mains surrounding the site. These mains consist of a 6 inch cast iron main in Pacific Avenue to the north, a 14" cast iron main in Beach Street to the west and a 6" PVC main in Viaduct street to the east.

There are four fire hydrants within close proximity of the site, preliminary discussions with the fire department indicate that no additional fire hydrants will be required to serve the new structure.

Domestic water and fire service will most likely be taken from the 6 inch cast iron main in Pacific Avenue. Water department records indicate that there is more than adequate pressure and flow to serve the site. Preliminary calculations indicate that a 4 inch fire service and a 1.5" domestic water service will be needed to serve the new building.

Sanitary Sewer Service:

Sewer service to the site is provided by the City of Santa Cruz Department of Public Works through existing sewer mains surrounding the site. These consist of a 12 inch main in Pacific Avenue to the north, a main just east of the eastern property line and a main south of the railroad right of way that traverses the site.

Sewer service will most likely be taken off of the 12 inch main in Pacific Avenue or the main just east of the eastern property line.

We would expect that either a 4" or 6" lateral will serve the site.

Storm Drainage:

The site has several storm drain lines surrounding it. Preliminary discussions with City Staff indicate that it would be preferable to take onsite drainage to the existing catch basins located in Pacific Avenue at the north and southwest corners of the site.

Storm water runoff from the site will be routed to a silt and grease trap prior to being released into the City Storm Drain System.



7.0 Project Schedule

7.1 Project Schedule

Background:

The Monterey Bay National Marine Sanctuary was established by Congress in 1992 and planning for a Visitor Center, to explore and understand this natural resource, began with a feasibility study in June 2002. The study was completed in two phases. The first phase, completed in January 2003, focused primarily on the investigation of 23 potential sites to locate the new facility. The second phase focused on program opportunities and final site selection, and was completed in March 2003.

In fall of 2004, the MBNMS, the City of Santa Cruz, the National Marine Sanctuary Foundation and Booz Allen & Hamilton completed the interview and selection process for the Architectural Design and Interpretive Exhibit Design services for the conceptual design of the Visitor Center. The firms of Thomas Hacker Architects Inc. and BIOS LLC were selected respectively.

The following is a proposed project schedule timeline*:

Pre-Design / Detailed Building Requirements
November 2004 - March 2005

Design and Documentation
12 Months

Bidding and Construction**
16 Months

Visitor Center Opening

(*) Subject to funding

(**) For the purpose of the cost model development, the start of construction is assumed to be January 2007.





8.0 Cost Model

8.1 Project Budget Narrative

Process:

The project budget and program were developed concurrently. Based on the initial program, square foot costs were assigned to each type of program space (office, exhibit, service etc.). An assumption of overall building efficiency was made based on information provided by the exhibit designer.

The budget was updated to reflect changes in the building program. As alternative conceptual plans were developed the efficiency factor was tested and refined. Specific features of the conceptual plans were identified and reviewed relative to the square foot cost model. This allowed the conceptual plan options to be distinguished based on their impact on the project costs.

The budget model informed decisions regarding the program size and the conceptual plan, particularly the size, arrangement and sequence of the gallery spaces. The approved conceptual plan was developed by the design team and a formal cost estimate was prepared by David Langdon.

Assumptions:

The pricing is based on beginning construction in January, 2007 and the project being completed in twelve months. The general contract will be competitively bid with qualified general and main subcontractors. The contractor will pay prevailing wages, but there will not be mandatory small business set aside requirements. The project will not be phased and contractor will have full access to the site during normal business hours.

The pricing reflects probable construction costs obtained in Santa Cruz at the present time. Allowances have been made

for escalation until the projected mid-point of construction. Neither the cost estimator nor the Architect can guarantee that the construction cost will not vary from the opinions of probable construction cost provided in the cost estimate.

Soft Costs:

The soft costs represented are an allowance. Generally the soft costs include project management fees, professional fees, permit and approval fees, survey, Geo-technical Engineering, hazardous material report and removal, testing, project signage, furnishings and equipment, and construction phase contingency. Sometimes soft costs include land acquisition and fundraising costs. As the project proceeds the City of Santa Cruz should develop a detailed Soft Cost budget.

Exhibit Costs:

Exhibit costs have been provided by BIOS LLC. Exhibit space is provided in the Building Construction Budget as shell only. The exhibit costs include all interior finishes, casework equipment and furnishings and mechanical, plumbing and electrical distribution within the exhibit areas. The exhibit budget also includes the exhibit water tank and distribution system.

MBNMS Visitor Center
Santa Cruz, California

Pre-Design Report - Detailed Building Requirements
8 April 2005

8.2 Summary of Probable Cost

Enclosed Area (SF)	16,168
Covered Area at 50%	697
Gross Area (SF)	16,865

Gross Site Area (SF)	49,887
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No.	Description	Cost/ SF	Total
Visitor's Center Building			
1	Foundations	\$7.35	\$124,000
2	Vertical Surfaces	\$12.27	\$207,000
3	Floor & Roof Structures	\$44.23	\$746,000
4	Exterior Cladding	\$45.60	\$769,000
5	Roofing, Waterproofing & Skylights	\$19.57	\$330,000
	<i>Subtotal</i>	<i>\$129.02</i>	\$2,176,000
6	Interior Partitions, Doors & Glazing	\$15.30	\$258,000
7	Floor , Wall & Ceiling Finishes	\$13.93	\$235,000
	<i>Subtotal</i>	<i>\$29.23</i>	\$493,000
8	Function, Equipment & Specialities	\$7.12	\$120,000
9	Stairs & Vertical Transportation	\$9.13	\$154,000
	<i>Subtotal</i>	<i>\$16.25</i>	\$274,000
10	Plumbing Systems	\$11.74	\$198,000
11	Heating, Ventilating & Air Conditioning	\$32.08	\$541,000
12	Electrical & Communications	\$28.28	\$477,000
13	Fire Protection Systems	\$4.33	\$73,000
	<i>Subtotal</i>	<i>\$76.43</i>	\$1,289,000
	Total Building 1-16	\$250.93	\$4,232,000
	General Conditions	10% \$25.09	\$423,200
	Contractor's Overhead & Profit	5% \$13.80	\$232,760
	Planned Construction Cost	\$289.83	\$4,887,960
	Design Contingency	15% \$43.47	\$733,194
	Escalation to Midpoint (July 2007)	14.17% \$47.23	\$796,518
	Recommended Building Budget	\$380.53	\$6,417,672

No.	Description	Cost/ SF	Total
Sitework			
14	Site Preparation & Demolition	\$2.18	\$109,000
15	Site Paving, Structure & Landscaping	\$10.62	\$530,000
16	Utilities on Site	\$1.04	\$52,000
	<i>Subtotal</i>	<i>\$13.85</i>	\$691,000
	General Conditions	10% \$1.39	\$69,100
	Contractor's Overhead & Profit	5% \$0.76	\$38,005
	Planned Construction Cost	\$16.00	\$798,105
	Design Contingency	15% \$2.40	\$119,716
	Escalation to Midpoint (July 2007)	14.17% \$2.61	\$130,055
	Recommended Sitework Budget	\$21.00	\$1,047,876
	TOTAL CONSTRUCTION BUDGET		\$7,465,547
	Estimated Soft Costs (w/o exhibits)	35%	\$2,612,942
	ESTIMATED TOTAL PROJECT COSTS (w/o exhibits)		\$10,078,489
	Estimated Exhibit Costs (from BIOS)		4,030,000
	TOTAL ESTIMATED PROJECT COSTS		\$14,108,489

Alternates		
1	Photovoltaic at Classroom (2000sf)	\$144,000
2	Water source heat pump	-\$55,000
3	Variable Refrigerant volume	-\$15,000
4	Packaged rooftop unit	-\$3,000
5	Glu-lam in lieu of Steel beams at curved roof	\$56,000



9.0 Code Review

9.1 Regulatory Agency Review

The following is a summary of regulatory information pertaining to the project site and program development. The information was received from various documents including but not limited to:

The City of Santa Cruz Beach and South of Laurel Comprehensive Plan dated October 1998
The City of Santa Cruz Beach and South of Laurel Area Plan Design Guidelines adopted October 1998
Exhibit B Amendment to the Beach and South of Laurel Area Plan Design Guidelines
The City of Santa Cruz Planning Department Analysis Memo
The City of Santa Cruz Depot Site Master Plan dated October 2001
Environmental Impact Report for Depot Site Master Plan (draft and final) dated April / June 2002
Executive Summary and Transportation Impact from the Coast Hotel Final EIR dated November 2004
The City of Santa Cruz Recommendation Report for the West Cliff Drive Bridge dated November 1995
The 2001 California Building Code, California Code of Regulations Title 24 effective November 2001

Property Designation: City-Owned Property (APN 004-091-25, 2, 3, 6)

Geo-Technical Report (Soil Conditions): Not yet received.

Planning and Zoning Issues:
General Plan/Local Coastal Plan

Zoning Designation: PK (Parks) designation allows public parks, recreational facilities, government and public facilities with approval of special use permit and design permit (unless exempt

by state or federal law). The project requires approval of coastal development from City of Santa Cruz with appropriate CEQA review and NEPA review (federal). Height limit: 50 feet per General Plan/LCP Plan.

Beach and South of Laurel Comprehensive Area Plan (B/SOL Plan): adopted in 1998, provides the governing land use, circulation and design policies for this area. Certified in 2002 by the California Coastal Commission as part of Santa Cruz's certified Local Coastal Program (LCP) for the Beach area. An amendment to the design guidelines for this area plan will allow for variation from the stated design characteristics for prominent signature projects if the design is appropriate to the location and function of the project and a design permit is obtained.

Depot Site Master Plan: approved by City Council in 2002 and incorporates the Fun Spot site. Plan encompasses 8.5 acres to include open space, public and transportation-related improvements, including a Natural History Museum. The City will relocate the existing skateboard park.

Traffic and Access: Payment of Fair-Share contribution to cumulative Beach area intersection and traffic improvements needs confirmation. In discussions with Union Pacific Railroad, a crossing of the existing tracks would be permitted per submittal, review and approval of crossing design concept. A clear right-of-way of 10' from the center line of tracks must be maintained clear of vegetation or other development. Any development over the rail lines must be a minimum of 22'-6" above the tracks.

Resources / Environmental Issues: Public views of the ocean from bike and pedestrian paths from the West Cliff Drive trestle bridge should be maintained. No formally designated public view corridor has been identified for this location. The City of Santa

Cruz indicated that the ocean view from the hotel located on West Cliff Drive does not need to be protected.

The West Cliff Drive trestle bridge is considered a cultural resource for the area due to the unusual truss design and use of timbers for the original 1918 bridge. Due to deterioration, the bridge was reconstructed in 2000 and was eligible to be listed on the National Register of Historic Places per a 1985 Caltrans study. Consideration of the bridge setting and view corridors have been requested in development of this site.

No archaeological resources have been identified on this site during the history of past development. Either subsurface exploration for archaeological resources should occur prior to development or monitoring of construction excavations for potential resources should be implemented to assure conditions.



9.2 Building Code Analysis

A preliminary code review of the project was conducted based on the 2001 California Building Code (CBC). The following is a summary of those findings:

Building Use or Occupancy: Based on the CBC definition, Group A occupancies are those which include the use of a building for the gathering together of 50 or more persons for purposes such as ...recreation, education or instruction. Per the occupant load factors in CBC Table 10-A, the lobby and exhibit areas support 438 occupants which classifies the Visitor Center as a Group A, Division 2.1 occupancy.

Allowable Floor Areas: The allowable floor area is dependent on the type of construction method selected for the building and the building occupancy. The CBC allows for area increases based on quantity of side yard separation, additional story allowances, and automatic sprinkler systems. Based on preliminary design considerations, the building type for the Visitor Center will be either Type II One-hour or Type III One-hour. The basic area allowance is the same for either construction types which permits a maximum single floor area of 13,500 square feet and a height limit of two stories.

The maximum allowable building area would be $13,500 \times 2$ (stories allowed) = 27,000 sf x 100% increased based on separation on all sides = 54,000 sf allowable per CBC. The additional area increase for use of an automatic sprinkler system will be applied as a substitution for one-hour fire resistive construction in lieu of additional area increase (CBC 508). Other factors limit the amount of development area (i.e. site size and zoning regulations).

9.3 Plumbing Fixture Analysis

Plumbing Fixture Analysis per 2001 CBC Appendix Chapter 29, Minimum Plumbing Fixtures

Background:

The preliminary plumbing fixture analysis was based on program areas (not actual areas) for the MBNMS. There are four occupancy type spaces for the project: exhibits, classroom, gift shop and offices. In reviewing the requirements in Table A-29-A, the most restrictive requirement was applied based on calculated occupants per use.

Group A:

Exhibit/Conference room based occupancy on 30 sf per occupant

Educational unit based occupancy on 30 sf per occupant

Group M:

Retail based occupancy on 200 sf per occupant

Group B:

Office based occupancy on 200 sf per occupant

Per these guidelines, the following occupancy was determined for the plumbing fixture requirements.

Exhibits:	5500 sf	divided by	30	=	184 occupants
Classroom:	1000 sf	divided by	30	=	34 occupants
Gift Shop:	800 sf	divided by	200	=	4 occupants
Offices:	840 sf	divided by	200	=	5 occupants
Conference Rm.:	200 sf	divided by	30	=	<u>7 occupants</u>
		Total:			234 occupants

Fixture requirements are assumed to be based on 50 percent male and 50 percent female which would be 117 males and 117 females based on the above calculations.

The majority use for the Visitor Center is classified as Group A Assembly occupancy and the most conservative fixture quantities are defined by Exhibit/Conference facilities. The described occupant loads were applied to the Group A Exhibit/Conference room minimum fixture count for the following requirement:

Water Closets:

Male: 3 WC*

Female: 3 WC

Lavatories:

Male: 3 Lav

Female: 3 Lav

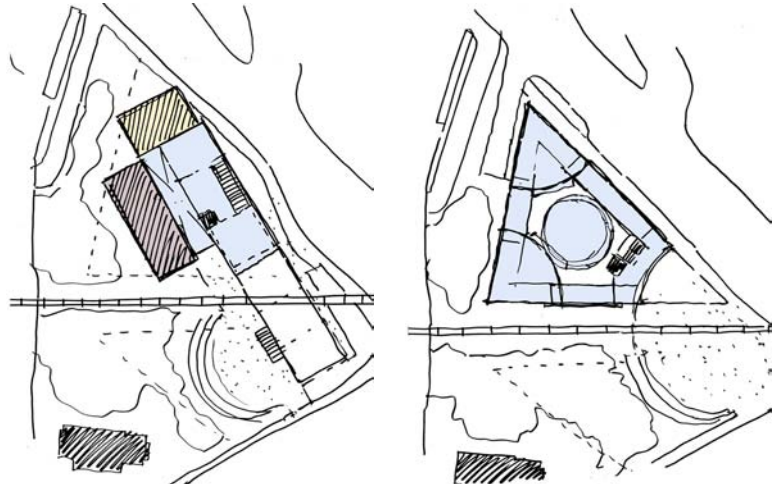
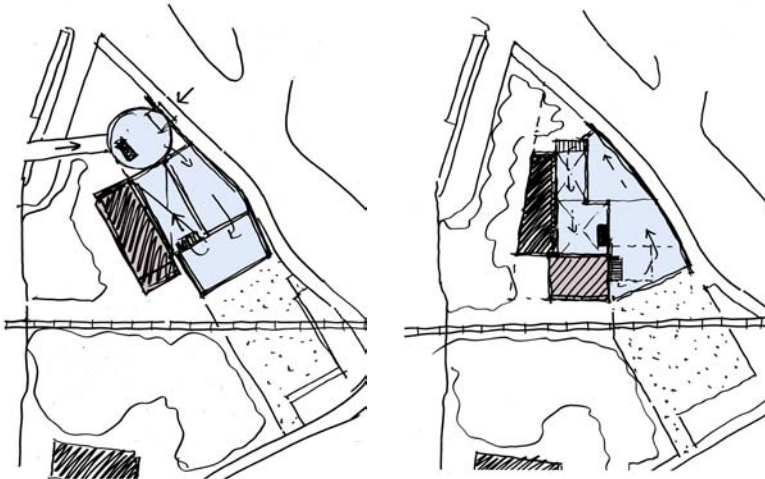
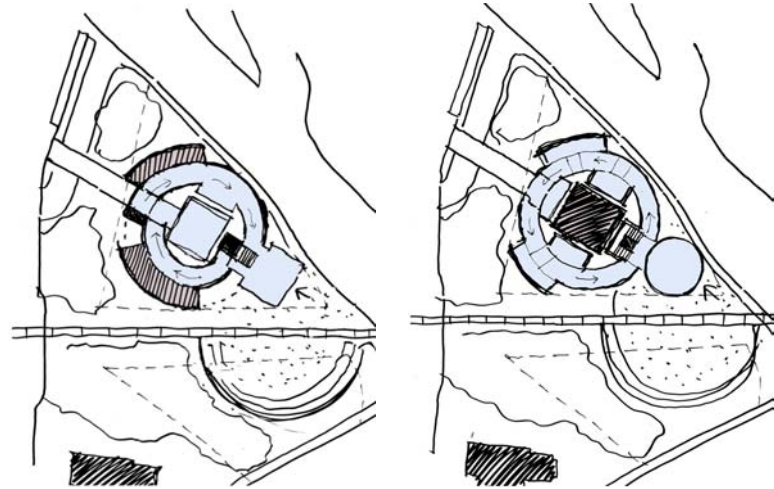
(*) Where urinals are provided one water closet less than the number specified may be provided for each urinal installed, except the number of WC can not be reduced to less than one half the minimum specified.

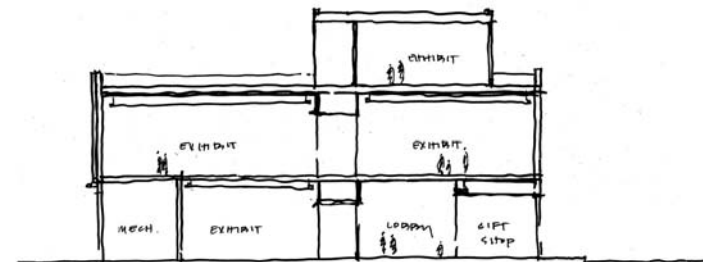
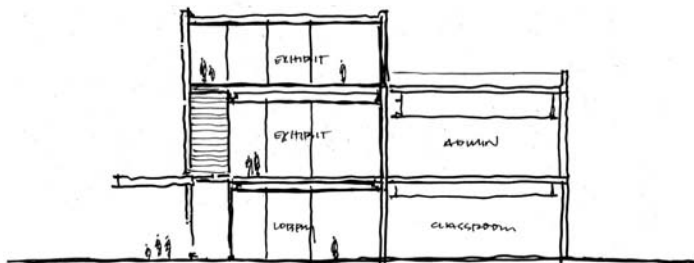
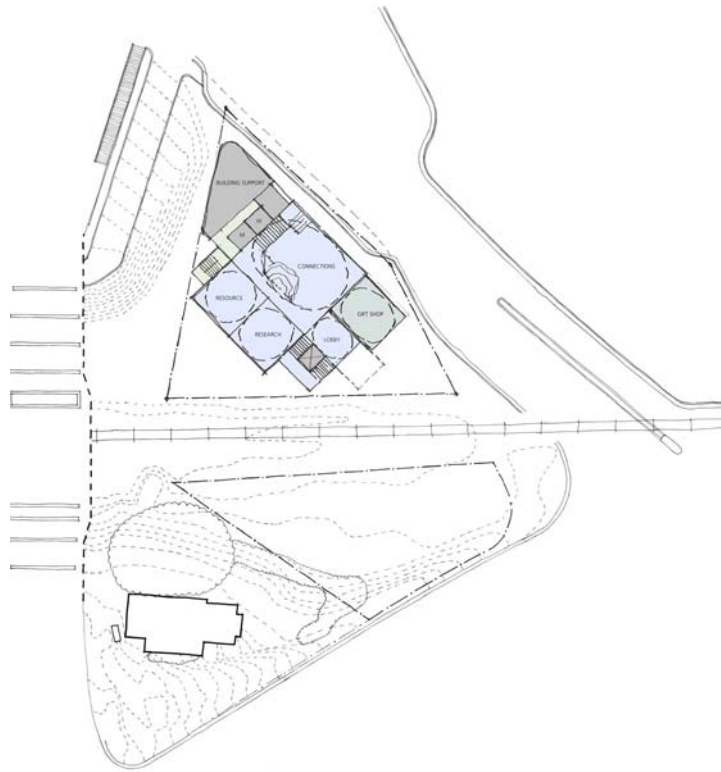


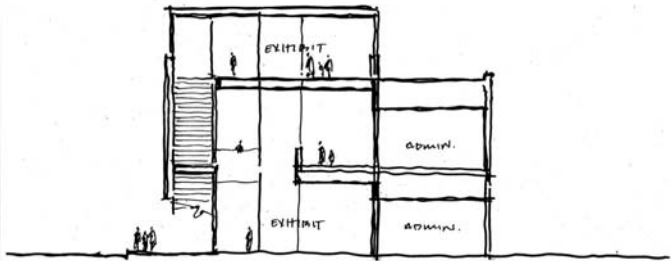
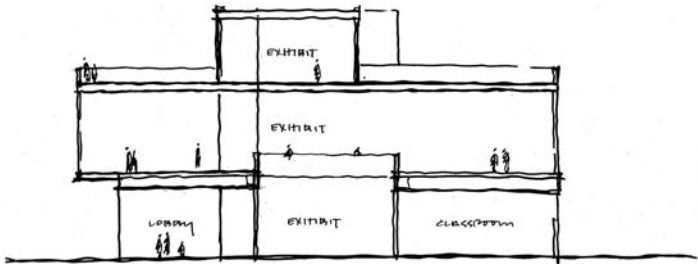
10.0 Previous Studies

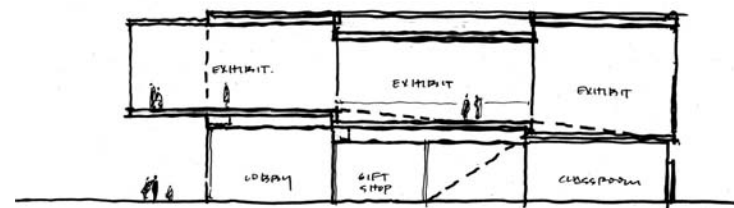
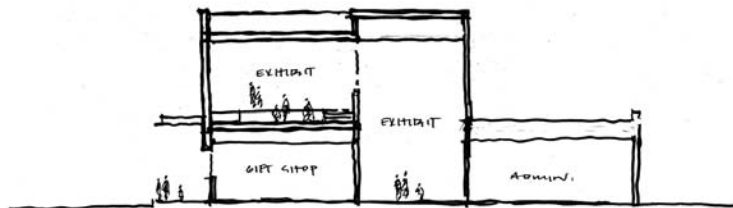
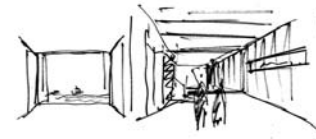
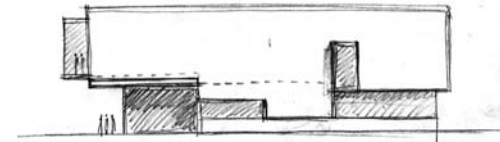
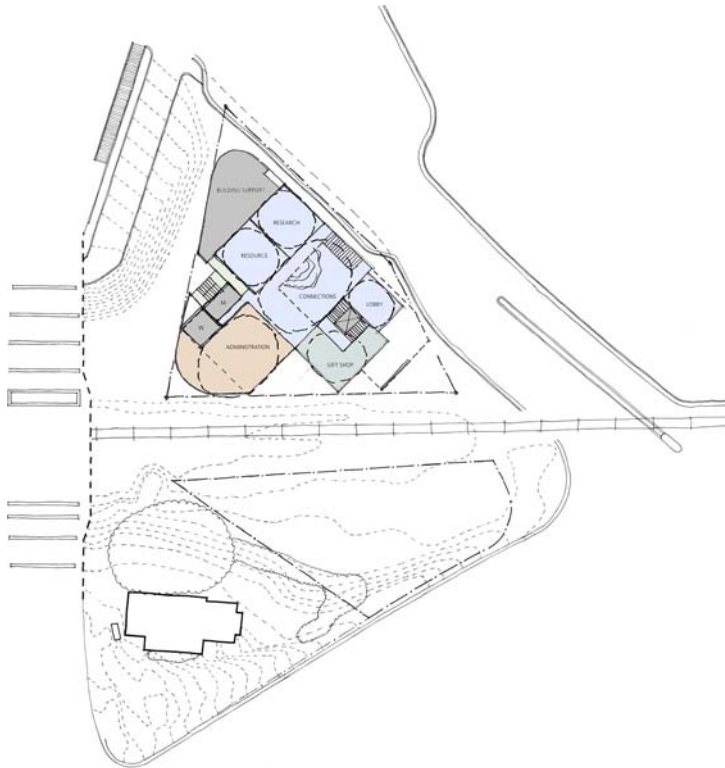
10.1 Previous Program Development

The following is a series of sketches of building and site design concepts explored during the Pre-Design Phase. These proposals were reviewed and discussed with the Steering Committee and form the basis of the evolution of the building and site design presented in this report.









10.2 Previous Site Development



